EUROPEAN TIME-SHARING INDUSTRY

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THE EUROPEAN TIME-SHARING INDUSTRY

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I INTRODUCTION

I INTRODUCTION

- This report describes the time sharing and remote batch services markets of the following major European markets:
  - United Kingdom.
  - West Germany.
  - France.
  - Netherlands.
  - Belgium.
  - Denmark.
  - Sweden.
- The study was carried out based upon INPUT personnel knowledge of these seven European markets enhanced by:
  - INPUT (Europe) computer services company files on services suppliers in those countries.
  - Work in progress to establish INPUT's European Company Analysis and Monitoring Service (CAMP/EUROPE).

- Telephone interviews with legal counsel/official committees to determine the constraints or barriers affecting banks wishing to offer RCS.

- Telephone interviews with one or more banks providing remote computing services in each country, to determine "de facto" limitations, if any, experienced by them, and to measure the competition in the financial services market. N.B. The reason for the study and the identity of CITIBANK were, of course, not revealed.

- The eleven banks/bank subsidiaries contacted were as follows:

U.K:	- Lloyds Bank Computer Services - Centre File (National Westminster)
West Germany:	- Byerishe Hypothecke Bank - West Deutsches Landesbank - Rechenzentrale Bavaria Genossenschaft
France:	- Natel (Banque Nationale de Paris) - G-CAM (Caisse de Dépots et Consignation)
Belgium:	- CIG/GTS (Sociéte Générale)
Netherlands:	- Alpha Computer Diensten (Middlestand Bank)
Sweden:	- SPADAB (Savings Banks)
Denmark:	- Multidata (All Major Danish Banks)

- Norway and Finland were not surveyed since the markets are too small to merit attention. The same applies to Luxembourg (which is normally included with Belgium in GPD reporting).

- Company (supplier) revenues are all based on 1976 returns since the vast majority of 1977 returns are yet to be updated.

- Communications costs are for 1977 in major countries (U.K., France, and West Germany), updated by telephone interviews with the PTT representatives in each country.

- Chapter II contains a summary analysis of the report's findings, the key market trends and INPUT's recommendations to CITIBANK for entering the European market.

- Chapter II identifies, country by country, the legal and "de facto" limitations (if any) that apply to banking organizations wishing to offer computer services in Europe.

- Each country market is analyzed in Chapter IV with an overview of the RCS market, the key competitors offering RCS, their revenues and market shares, pricing considerations, customer distribution, communications costs and conclusions that can be drawn.

- Chapter V looks at the financial applications market, trends in its development, and lists the main packages now producing significant revenues on the European market.

- Chapter VI analyzes the respective merits of alternative market strategies that can be followed in approaching the European market.

- Chapter VII, Profile Of A Successful Time Sharing Vendor, looks at one of the most aggressive and successful timesharing vendors in Europe, COMSHARE, and provides its growth from inception, revenue size and composition, staff by function, market and product strategy, services offered, price list and contractual conditions used.

- Appendices include:

  - The definition of terms used and the local currency conversion rates used to express dollar values in the report.

  - The list of companies contacted, addresses, telephone numbers, and contacts. (This should be used with caution since none of them were told the purpose of the interview.)

  - A list of the computer services associations contacted.

II SUMMARY RECOMMENDATIONS

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A. EUROPEAN MARKET OVERVIEW

- Western European RCS, worth \$712 million in 1977, is a relatively small proportion (24%) of the total computer services market, but is gaining ground rapidly. Within RCS, timesharing services are the fastest growth area, and grew by 29% between 1976 and 1977. Remote batch services grew at the much slower rate of 9%.

- The RB services market is more than three times larger than the timesharing market, however, and produced sales of \$512 million in 1977, up from \$469 million in 1976.

- France is the largest total RCS market in Europe, and easily had the highest RB revenues in 1977. The U.K. was the best timesharing market, however, with revenues of \$53 million.

- On terms of sheer size, only three markets are worth attention: France, Germany, and the U.K. However, this would be overlooking the advantages of an international operation based in Brussels, Belgium, or the combination of hardworking, multilingual personnel coupled with low corporation tax offered by the Netherlands.

- Denmark is the only market from which CITIBANK would be legally excluded. All others are "open," in one way or another, to the establishment of an RCS operation. (Note: For this very reason, Denmark is only summarily analyzed in Section IV.)

- End-user pricing considerations favor Sweden, West Germany and to a lesser extent France and the Netherlands. These are the countries where identical services command the highest prices.

- Cost considerations favor the U.K. above all other countries. In no other country are good quality people paid so little. Accommodation is also reasonably priced (in relation to Europe, not to the U.S.).

- Communications availability is best in the following countries (in order of priority): West Germany, Sweden, Netherlands, and the U.K. Communications quality is best in Germany and Sweden.

- Competent staff are becoming scarce in Europe. Thus, acquisition, while frequently a tedious and lengthy operation, often produces client base, products and trained staff that fully justify the wait.

- Competition for RCS services is strong everywhere but relatively weakest in Germany (of the countries analyzed).

- A summary of the market characteristics of each country is given in Exhibit II-1.

B. MARKET IDENTIFICATION

- "Entry into Europe" should not be the goal. It is beyond the resources of the largest computer services groups. "Entry into the U.K./French/German market is also vague and is difficult to structure.

EXHIBIT II- 1

COUNTRY MARKET CHARACTERISTICS

RANK	COUNTRY	RCS MARKET SIZE	END USER PRICING	ACCOMODATION/ STAFF COSTS	COMMUNICATIONS		
					AVAIL- ABILITY	COST	QUALITY
1	UNITED KINGDOM	●	◒	◒	●	◕	●
2	FRANCE	●	◕	◕	◕	●	◕
3	GERMANY	◕	●	●	●	◕	●
4	SWEDEN	◒	●	●	●	●	●
5	NETHERLANDS	◒	◕	◕	◕	◕	◕
6	BELGIUM	○	◕	◕	◕	◕	◕
	DENMARK	○	◕	◕	●	◕	●

LEGEND: ● VERY HIGH ◕ HIGH ◒ MEDIUM ○ LOW

- On the other hand, "Entry into the London-based foreign bank market for asset accounting and international financial dealing" immediately identifies the goal, the prospects, the applications and the competition.

- Broadly speaking, there are three categories of financial application prospects: industrial companies, financial companies and accounting/management consultancy houses. The applicational needs for each are in part common and in part specific to each.

- Whereas payroll and general accounting are common to all three applications such as audit and taxation, production/inventory and investment analysis are specific to only one category. Within each category the range of financial applications does not go beyond seven or eight categories or five or six applications.

- Once the prospect sector is chosen, the applications choose themselves, as do the optimum languages needed (although a specific approach may be adopted, if CITIBANK has a TABOL-equivalent available, for example, or wishes to base all of its applications on a data base language, etc.

- The competition present on the market must then be analyzed in order to determine acceptable/competitive end user pricing and contractual conditions and to determine the marketing arguments that justify the choice of the CITIBANK product.

- The strategic options are also clarified in the light of what is available compared to goal sought (see below).

- The main characteristics of each market are summarized in Exhibit II-2.

EXHIBIT II-2

EUROPEAN COMPUTERS SERVICES MARKET SIZES, 1976-1977

COUNTRY	1976					1977				
	RCS		BATCH	OTHER	TOTAL	RCS		BATCH	OTHER	TOTAL
	T/S	RB				T/S	RB			
FRANCE	$ 38.0	$116.0	$ 206.0	$156.0	$ 516.0	$ 48.0	$125.0	$ 227.0	$198.0	$ 598.0
GERMANY	15.0	70.0	242.0	128.0	455.0	16.7	81.3	270.0	167.0	535.0
UNITED KINGDOM	44.0	71.0	170.0	115.0	400.0	53.0	75.0	190.0	150.0	468.0
SWEDEN	8.5	42.5	129.0	55.0	235.0	11.0	47.0	140.0	70.0	268.0
NETHERLANDS	9.3	36.7	96.0	55.0	197.0	12.0	41.0	102.0	68.0	223.0
DENMARK	5.0	24.0	97.0	40.0	166.0	6.5	26.5	106.0	52.0	191.0
BELGIUM	4.5	15.5	35.0	25.0	80.0	5.9	18.6	41.3	33.2	99.0
WESTERN EUROPE	$155.0	$469.0	$1,259.0	$717.0	$2,600.0	$200.0	$512.0	$1,359.0	$912.0	$2,983.0

($ MILLION)

C. STRATEGY ALTERNATIVES

- There are four basic market entry alternatives to a U.S.-based RCS supplier (whether bank-owned or not, if we exclude Denmark). These have been likened to and analyzed as mini-case studies of U.S. vendors who have followed different approaches over the past 5 years.

1. THE "COMSHARE" APPROACH

- This approach is that of marketing external processing power (provided by transatlantic cable) and the leveraging of each of the national markets entered.

- It has been very successful, in terms of revenue growth and profit expansion, but has been highly dependent on the early identification of local-need applications which are satisfied by a locally-developed package(s). These were then leveraged by heavy marketing emphasis and constantly expanded by improvements to the package(s).

- The success of such a venture is also dependent on competitive pricing which maintains the "edge" over local competition.

- (COMSHARE is fully analyzed in Section VI.)

2. THE "ADP" APPROACH

- This is dependent on an aggressive acquisition program of companies that have a profile "fit" with the parent/acquirer in terms of equipment used, applications offered, services provided, etc.

- The gradual accumulation of local processing capability is fed by transferring processing workloads from one group to another, eliminating centres, clients that do no "fit" (i.e., have non-standard requirements) and company activities that are not germaine to the mainstream activities (in this case batch, RB, T/S processing of payroll, general accounting and auto parts analysis).

- The sales/marketing groups are maintained and strengthened and, since other parts of the companies acquired are reduced or eliminated, the ratio of marketing to operations increases.

- This asset stripping approach has been very successful and, above all, profitable. ADP began with IEA in Holland (batch services), acquired European Timesharing services through Cyphernetics, expanded them with the TSL acquisition (Delos) and again with Management Dynamics (U.K.).

3. THE "MCAUTO" APPROACH

- This is basically a joint venture, based on the provision, by the U.S. partner, of specialized applications that correspond to the profile and market image of the European partner.

- Using the joint resources of both the U.S. and European partner (particularly the marketing staff of the latter), an industry specialized market thrust is organized using the local processing capability of the European partner and the combined product catalogue of both.

- As the processing demand builds, the U.S. resources are brought into play, both in machine time and in specialized support staff.

- MCAUTO's ventures with Société Nationale de Pétroles Acquitaine never got off the ground through (a) a failure to clearly define the respective roles of each partner, (b) the inadequate size of SNP's RB services department, (c) the gradual disenchantment of MCAUTO as the months went by and little was achieved.

4. THE "RAPIDATA" APPROACH

- This is based on the creation, from scratch, of a marketing and support operations in what is judged to be the best market (in this case the U.K.), with the hope of buliding from there as the client base grows.

- This approach is highly dependent on the people chosen, the rapid creation of a good market image and the existence of a well-monitored business plan.

- Rapidata had a sketchy business plan, chose inadequate staff (who spent most of the budgeted first year expenses without achieving much revenue) and provided little local guidance and support. They then tried, unsuccessfully, to back out of the market as fast as they had come in.

D. SUMMARY CONCLUSIONS - AND A FIFTH STRATEGY

- A composite strategy utilizing the best parts of the foregoing and phasing their application is recommended.

- Phase I: A joint venture or outright acquisition is established with a locally implanted batch/RB company serving the largest market area in the country chosen and that possesses one or more well-defined financial applications. A joint product list is drawn up, including relevant U.S.-developed packages that can be applied to the local market. An internal training program clarifies the new role and products of the company and marketing/support groups are organized along product/service lines. Additional specialized marketing staff is recruited as required.

- Phase II: After developing an initial customer base from the largest sub-market, small acquisitions are sought that expand the national market coverage to complement the existing base, simultaneously expanding the client base, marketing coverage, revenue and product list.

- Phase III: Industry coverage is expanded to broaden the market sectors and to fully utilize the country wide marketing/support coverage now available.

- Phase IV: A second European market is entered on the same basis.

- The phased approach minimizes the risks and serves to concentrate management attention on clearly identified goals.

- The joint venture approach in Phase I has the advantage of providing a ready-made base for market launch of existing products while expanding the services offered by the European partner. (Should things not work out, little has been lost and a market withdrawal presents few difficulties.)

- Note that it is recommended that full product and market coverage be developed in one national market at a time, thereby avoiding dispersion of resources and management attention.

III BANKS IN EUROPEAN REMOTE COMPUTING SERVICES

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A. RESTRICTIONS AND BARRIERS

- Limitations on the entry of bank-related organizations into the European RCS market are, as a rule, not based upon legislation but on "de facto" barriers imposed by the banking community or the computer services companies themselves (see Denmark).

- When imposed by banks, these barriers usually consist of no more than obtaining formal approval from the central national bank which manages monetary policy (e.g., La Banque de France, the Bank of England, the Deutsche Bundesbank, the Banco d'Italia, etc.)

- This can prove just as rigid as formal legal exclusion if approached in the wrong way, but can be circumvented in most cases through the creation of "arm's-length" subsidiaries. When imposed by the computer services community, however, the barrier is not so easily circumvented.

- In some countries (e.g., U.K., Belgium) approval is a formality since many precendents have already been established. In others (e.g., France), despite the many banks active in the domestic computer services market, formal approval must nevertheless be sought. (In this case from the Ministere des Finances.)

- Bank-owned computer services companies earned in excess of a quarter of a billion dollars in 1976 in Western Europe. This value has grown regularly at between 22 and 26 percent each year since 1971.

B. EUROPEAN BANK-OWNED COMPUTER SERVICES COMPANIES

- All Western European countries have bank-owned or bank-operated computer services companies offering standard batch and RCS processing services.

- The involvement of banks, both direct and indirect, in computer services companies in Western Europe is extensive as indicated by Exhibit III-1. This involvement is particularly evident in France. All such companies offer RCS.

- Ownership ranges from partial participation to a 100% holding. The size of the company owned ranges from $33 million to less than $5 million. The involvement of the banks, through these subsidiaries, in the computer services industry extends to all service categories: software houses, system houses, batch bureaux, etc.

- The largest European bank-owned company is SLIGOS (France), 92% owned by Credit Lyonnais. This is, in fact, a group of 10 limited companies. The chart of Credit Lyonnais holdings gives a good idea of how tortuous European company control can be.

- A popular formula is that of joint holding, by a consortium of banks, in a computer services subsidiary which provides internal services to the banks and the external services to the open market. SPADAB (Sweden), Telekurs (Switzerland), BIK and Alldata (Germany), and Multidata (Denmark) are examples.

- France has the highest density of bank owned computer services vendors with seven major banks holding shares in one or more vendors.

EXHIBIT III-1

TOP BANK-OWNED COMPUTER SERVICES COMPANIES IN WESTERN EUROPE

RANK	VENDOR	COUNTRY	MAIN ACTIVITIES	BANK OWNED BY/OR PATICIPATION	1976 REV-ENUE ($M)
1	SLIGOS	FRANCE	P/R/B	CRÉDIT LYONNAIS	$32.9
2	SPADAB	SWEDEN	R/B	CONSORTIUM OF SAVINGS BANKS	32.3
3	G-CAM	FRANCE	R/B	CAISSE DE DÉPOTS & CONSIGNATIONS	30.6
4	CCMC	FRANCE	R/B	SOCIÉTÉ GÉNÉRALE	26.2
5	NATEL	FRANCE	P/R/B	B.N.P.	24.1
6	CIG/GTS	BELGIUM	P/R/B	SOCIÉTÉ GÉNÉRALE*	16.9
7	BARIC	UNITED KINGDOM	R/B	BARCLAYS BANK	13.2
8	TIETOTEHDAS	FINLAND	P/R/B	VERENINGS BANK	9.8
9	DATA MANAGEMENT	ITALY	R/B	CREDITO ITALIANO	9.4
10	ALPHA COMPUTER DIENSTEN	NETHERLANDS	P/R/B	MIDDLESTAND	8.7
11	CENTRE-FILE	UNITED KINGDOM	R/B	NATIONAL WESTMINSTER	8.6
12	INTERDATA	SWITZERLAND	P/R/B	HOLDER BANK FINANCIÈRE	7.6
13	TELEKURS	SWITZERLAND	R/B	BANK CONSORTIUM	7.4
14	BIK	WEST GERMANY	P/R/B	COOPERATIVE CREDIT BANK	6.1
15	ALLDATA	WEST GERMANY	P/R/B	BANK CONSORTIUM	5.7
16	MULTIDATA	DENMARK	P/R/B	BANK CONSORTIUM	$ 5.0

* = NOTE THAT THIS IS NOT THE SAME SOCIÉTÉ GÉNÉRALE AS FOR CCMC

ACTIVITIES CODE:
P = PROFESSIONAL SERVICES
R = REMOTE COMPUTING SERVICES
B = BATCH SERVICES

C. COUNTRY RESTRICTIONS ON BANK-OWNED SERVICES

- Restrictions on operating computer services companies owned by banks vary considerably from country to country. These are examined individually below.

1. UNITED KINGDOM

- There are no formal restrictions on banks wishing to offer RCS or other computer services in the U.K. Nearly all of the major banks are engaged in the services market either directly (via their own in-house computer services departments) or indirectly (via wholly-owned or partially-owned subsidiaries).

- Lloyds Bank and Midlands Bank both supply services via their in-house computer services departments and both supply a payroll service:

  - "Lloyds Bank Pay Service."

  - "Midpay" (Midlands).

- Barclays Bank and National Westminster confine all of their external computer services to their subsidiaries:

  - BARIC (Barclays).

  - Centrefile (National Westminster).

- In line with the type of service offered, certain restrictions are applicable. For example, if the pay service includes an automatic debit/transfer system, authorized originator numbers must be obtained from the central registry held by the Committee of London Clearing Banks (CLCB), which also requries a comprehensive indemnity to be lodged with them to protect the bank using the service.

- Other computer services offered by the major banks include check conciliation (on a magnetic tape) for entry collection checks, and entry collection credits (for head office collection) that use E13B pre-encoded GIRO credit slips.

2. WEST GERMANY

- There are no legal restrictions on a bank providing RCS to the West German market. Many of the West German banks operate a common data centre, operated on a service basis, grouped according to their category.

- The regional (Landes) Girozentrales or savings banks groups frequently have a common data centre as do the small cooperative banks (Genossenschaftskasse); e.g., the Rechenzentrale Bavaria Genossenschaft.

- Large banks (Deutscher Bank, Dresdener Bank) tend to use their own internal EDP centres.

- Few of these offer outside services, but there are some exceptions; e.g., Westdeutsches Landesbank, which offers batch and NIS services and ALLDATA a subsidiary of a banking consortium, is currently putting its batch operations on-line.

- Services to the banks themselves is therefore practically impossible. Taylorix (part owned by TYMSHARE INC.) has tried to enter this market and failed with the large banks. They now intend to try the medium-sized banks. More significantly, the German market is strongly batch (local) oriented and RCS faces a strong challenge from the entrenched, small batch bureaux.

- The key to the German market is acquisition. The strong West German sensitivity to the confidential nature of information handled makes this route practically the only way to enter the market successfully. (Confidentiality of information on West German companies extends to market research, where it is illegal for a West German market research group to release data that can be identified with a specific company name.)

3. FRANCE

- All investments of a foreign company in France, when they concern a business entity of more than 20 people, must obtain clearance via the "Procédure des Investissements Étrangers, Ministère des Finances" in Paris. Below the 20 people size, no authorization is required.

- The simplest method for a bank to provide computer services is via the creation of a wholly owned subsidiary. However, if the terminals used for RCS are also used for bank transactions (i.e., if bank-related data physically transits through the same hardware as that used for RCS), then approval is required from the "Commission de Controle des Banques," another section of the Ministère des Finances.

- Seven major banks have substantial holdings in very big computer services companies:

- BNP	(NATEL - 90% holding)
- Crédit Lyonnais (See Exhibit III-2)	(SLIGOS - 92% holding)
- Sociéte Générale	(CCMC - 39.4% holding)
- Sociéte Générale	(GSI - 24% holding)
- CCF	(GSI - 24% holding)
- Caisee de Dépots & Consignations	(G-CAM - 99% holding)
- Banque NSM	(GFI - 99% holding)
- Banque de Paris et des Pays-Bas	(SEMMA - 100% holding)

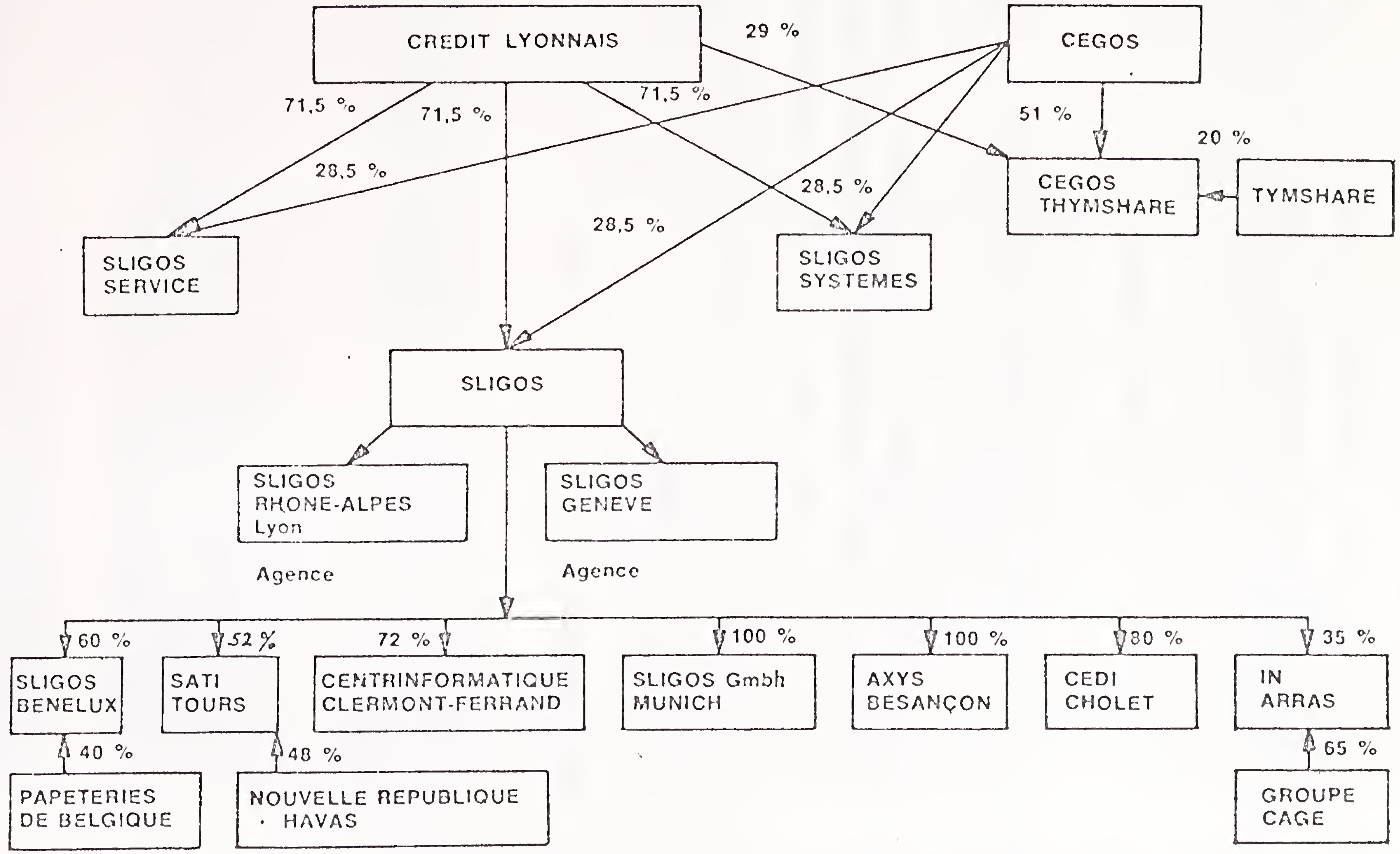
- This very close relationship of banks and computer services activities has not always been a happy one; e.g., NATEL's restructuring difficulties, highlighted by the specialized press in 1977. (BNP would be quite happy to divest itself of NATEL.)

4. BELGIUM

- Authorization is required for a bank or bank subsidiary to develop computer services activities in Belgium, and must be obtained from the "Commission Bancaire" in Brussels.

EXHIBIT III-2

CRÉDIT LYONNAIS HOLDINGS



- This commission is a combination of government officials and banking representatives who examine the consequences of diversification intentions and try to prevent unfair competition developing as a result of proprietary interests.

- There have been several precedents in which authorization has been given, the most notable and successful of which is CIG/GTS, the subsidiary of Société Générale, which offers timesharing (G.E.'s representative for Mark III services in Belgium, software products, professional services and batch services).

- CIG/GTS also sells and maintains terminals, micro and minicomputers and had a 1976 total revenue of $16.9 million, of which an estimated 10% was in RCS.

- Competition in financial services is sharp in Belgium and is presently concentrated in six companies: CIG/GIS, IBM, CEPDC, ORDA-B, UCC, and CDC. All others are small, marginally profitable suppliers, but there are several with strong support from outside of Belgium which will allow them to develop over the next five years. These include Cyphernetics (ADP), CSC, Comshare, and SLIGOS.

5. NETHERLANDS

- Dispensation is required for banks to enter any activity which may be considered as diversification and must be obtained from the central Dutch Bank.

- It (the Dutch Bank) is presently reluctant to allow banks to directly enter computer services activities of any kind and discourages all non-banking developments. This restraint applies mainly to computer services departments of banks, however, rather than subsidiaries.

- This is not a legal constraint (more in the nature of an inter-bank agreement), and in any case can be avoided by creating an "arm's length" subsidiary for which dispensation is not required and to which no restrictions apply.

- This is precisely the status of Alpha Computer Diensten, which is a subsidiary of the Middlestand Bank, offering remote computing services, batch services and professional services. ACD had a 1976 turnover of $8.7 million.

- Strong competition in the financial applications area comes from Central Beheer (CEA) who provide general accounting and payroll services and whose 1976 turnover was $13.2 million, HB-NIS (Honeywell's T/S marketing group), IBM and CCN (see Section IV).

6. DENMARK

- Due to a strict interpretation of the Banking Act of 1973, there is strong opposition to bank-operated or bank-owned computer services groups in Denmark, even to those that have already managed to establish themselves. In essence, there is no chance of a foreign bank setting up computer services operations in Denmark.

- In addition to the legal barrier, opposition comes from the computer services companies themselves, organized around the Computer Services Association, Foreningen Af Danske EDB Servicebureauer (FDE). (This is somewhat surprising since some of the intended victims are members of the very same association!)

- Their targets are mainly the Danish EDB Centre which is run by a group of small banks in the North of Denmark, and especially Multidata, a bureau operated jointly by all of the major Danish commercial and savings banks.

- The FDE campaign, now underway, is based on the conviction that many financial services, if integrated into the operation of standard bank services, provide convenience and simplicity that cannot be duplicated by Bureaux that are not allied with a bank.

- The pressure on exisiting services reached a point, two years ago, where Multidata sold off its accounting-package operations because, in the words of Peder Schlegel, the Managing Director, "It wasn't worth the trouble it was causing us."

7. SWEDEN

- The Swedish market places no obvious limitations on bank-owned computer services operations although the data on this market, through an insistance by the banking and legal contacts on written exchanges rather than telephone conversations (acceptable everywhere else) cannot be considered as adequate on this point.

- The second largest bank-owned subsidiary in Europe, SPADAB, suffers from no apparent restrictions and has grown dramatically over the last five years. In 1976, sales were $32.3 million.

- Exhibit III-3 summarizes the relative attractiveness of European RCS markets for bank- owned entities.

EXHIBIT III-3

RELATIVE ATTRACTIVENESS OF EUROPEAN RCS MARKETS FOR BANK OWNED ENTRANT

RANK	COUNTRY	MARKET VULNERABILITY (i.e., LACK OF restrictions)	MARKET SIZE	COMPETITION FROM BANKS
1	UNITED KINGDOM	●	●	◔
2	FRANCE	◕	●	◕
3	GERMANY	●	◕	◔
4	SWEDEN	◕	◔	◕
5	NETHERLANDS	◔	◔	◔
6	BELGIUM	◕	○	◕
7	DENMARK	○	○	○

LEGEND: ● HIGH ◕ MEDIUM ◔ SMALL ○ LOW

(EXAMPLE:
- "HIGH" MARKET VULNERABILITY = EASY TO ENTER
- "HIGH" SIZE OF MARKET = LARGE MARKET
- "HIGH" COMPETITION FROM BANKS, IS OBVIOUS)

IV COUNTRY MARKETS

IV COUNTRY MARKETS

A. UNITED KINGDOM

1. OVERVIEW

- The remote computing services market is extremely well developed in the United Kingdom and growing very rapidly (22% per annum). In 1977 RCS was worth $115 million, of which $66 million was remote batch services.
- An INPUT analysis of the largest U.K. companies showed that there is still a high number of important organizations spending upwards of $20,000 per month on EDP services, who are prepared to switch to a competitive service providing guarantees of reliability are offered and the new service is economically justified.
- The computer services industry in the U.K. is composed of 530 active companies. Over 900 are known to the National Computer Centre (NCC) to have existed at one time or another over the last five years, many of which have merged or been acquired and appear under different names today.
- A large proportion of the remainder have gone out of business, such that the U.K. market now presents the profile of a market which has achieved a measure of consolidation.

- The U.K. is the hunting ground, par excellence, of U.S. computer services groups wishing to acquire an operational base in the European market. ADP, OLS and Martin Marietta have all established themselves in the U.K. via acquisition.

- Combined with the acquisition strategy of large spin-off services companies like British Oxygen and Unilever, this trend has led to the formation of large, aggressive, multi-service vendors in the U.K.

- The vast majority of computer services vendors (69%) are privately owned. None are quoted on the stock exchange.

- In the last five years the number of spin-offs (or organizations who set up their EDP departments as separate entities offering computer services) has increased.

2. COMPETITION

- The large number of RCS suppliers already established on the market should not be considered as a deterrent to the creation of a new supplier. Competition is spread regionally; i.e.:

REGION	MAIN COMPETITION ENCOUNTERED
Southwest	IBM, HIS, Atkins
Southern Central	COMSHARE, HIS, ADP Network Services
Southest	Cybernet, HIS Prime Other Small Companies
Midlands	SYSTIME, HIS System Houses
North/Scotland	SYSTEMSHARE, HIS, COMSHARE

- Honeywell (HIS Ltd.) is the only supplier who covers the entire country and whose presence is felt everywhere. Honeywell is more concerned with growth than with competition, an indication of the buoyant state of the U.K. RCS market.

- Honeywell has approximately 200 sales and support personnel marketing the DMS and TABOL-based services that make up most of its revenue and would like, ideally, to increase this by up to 150 salesmen since it feels the business is there to justify this expansion. Currently the salesmen select which leads they will follow every day, discarding many which are never followed up.

- In-house minicomputers are competition to RCS and are beginning to cause lost business. Main motivations for the end user to change is lack of expertise available from the RCS supplier when new applications are developed.

- Value added networks, mainly available through CSC and Tymshare, have had no real impact on the RCS market, as yet.

- CDC provides mainly remote batch services and, in the words of its competitors, is "rarely seen" in competitive situations. The drastic pruning of the Brussels-based European headquarters has unsettled the data services group. The Call 370 service acquired from IBM has been partially merged with the Cybernet service but with limited marketing success.

- Exhibit IV-1 provides a ranking of the major vendors.

3. MARKET SHARES

- The estimated market shares for 1976 revenue for each of the major competitors in the U.K. RCS market are shown in Exhibit IV-2.

- The main competition in the U.K. RCS field is between IBM, Honeywell, and COMSHARE. The latter two companies have, in some cases, indentical software (e.g., SDRC) such that any improvements in running efficiency result

EXHIBIT IV-1

MAIN RCS COMPETITORS IN UNITED KINGDOM

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	IBM	$13.6*	$ 2.4*	$16.0*	$24.0*
2	HIS	0.2	13.6	13.8	13.8
3	COMSHARE	1.4	5.7	7.1	7.1
4	BOC	6.8	-	6.8	15.7
5	ADP	+	6.5	6.5	6.5
6	UCSL	5.7	0.5	6.2	12.2
7	CENTREFILE	5.6	+	5.6	10.0
8	UCC	5.0	--	5.0	9.8
9	CDC	1.6*	1.6*	3.2*	4.2*
10	SCICON	2.5*	-	2.5*	8.4*
11	SIA	$ 2.0	$ 0.1	$ 2.1	$ 5.7

($ MILLION)

SOURCE: INPUT CAMP/EUROPE

* = INPUT ESTIMATE

+ = SMALL VALUE

EXHIBIT IV-2

MARKET SHARES OF UNITED KINGDOM FIRMS

COMPANY	SHARE OF RCS MARKET (%)	
	INTERACTIVE & DATABASE	REMOTE BATCH
- IBM	5%	23%
- HIS	31	*
- COMSHARE	13	*
- BOC DATASOLVE	-	12
- ADP	15 %	* %
* = SMALL VALUE		

in lower costs to the client base (which can easily change from one supplier to the other). IBM, meanwhile, is restructuring its previously batch processing, decentralized bureau centres, bringing them all on-line with a new super centre in the Midlands.

- ADP is building on a strong timesharing presence (Cyphernet and TSL Ltd. acquisitions), but has had some difficulties in maintaining reliability.

4. PRICING

- In the U.K. RCS market, pricing tends to be set by Honeywell who prices its services at a premium to the other suppliers in the market.

- Until recently, market price charges have followed a pattern. Honeywell modifies its prices, followed one month later by COMSHARE, and by ADP Network Services six months later. IBM has not had appreciable influence to date.

- In 1977 this pattern was broken. Honeywell raised its prices but its closest rival, COMSHARE, did not. ADP also kept prices unchanged.

- Supplier's evaluation of each other's pricing is usually carried out by buying time on each other's systems and running company benchmarks.

- The market is very price sensitive and, as a result, the vendors tend to move as a closely-knit group.

5. CUSTOMER DISTRIBUTION

- Before the advent of RCS, suppliers went where the customer base was. An analysis of the geographical distribution of computer services companies as shown in Exhibit IV-3 provides a good indication of customer populations.

- Of the major vendors, 80% have their main operational base in London. However, IBM's recent location of their RCS supercentre in the Midlands is

EXHIBIT IV-3

UNITED KINGDOM VENDOR GEOGRAPHICAL DISTRIBUTION

LOCATION	SERVICE CATEGORY (%)	
	PROCESSING	CONSULTANCY AND SOFTWARE
ENGLAND		
- NORTH	8%	17%
- EAST	1	2
- MIDLANDS	11	17
- SOUTHWEST	2	5
- S.E. AND LONDON	67	54
SCOTLAND	7	3
IRELAND	3	1
WALES	1	1
TOTAL	100%	100%

SOURCE: COMPUTER USER'S YEARBOOK 1977

ample evidence of the independence of processing location with respect to the customer base served. This centre will supply computing power to most of Europe.

- The above distribution therefore serves to indicate where sales and support offices are needed; i.e., where the main prospect areas lie. The RCS centre itself can be located anywhere, providing concentrations are strategically placed to reduce end user line changes.

- Seventy-seven percent of the U.K. computer services industry revenue comes from the private sector, 14% from the public sector (4% from central government) and 9% from clients based outside the U.K. The details are summarized in Exhibit IV-4.

6. COMMUNICATIONS

- While Public Switched Network (PSN) lines are relatively costly, leased lines are very cheap and of good quality.

- U.K. networks using PSN lines have a critical cost breakpoint at 56 kilometers, above which line costs are tripled.

- Connection charges are reasonably inexpensive for PSN and S3 quality lines. The costs for both of these are practically the same (see Exhibits IV-5 and IV-6 for costs and line category definitions).

- T quality circuit connection charges are from 33% (short distance) to 60% (long distance) more expensive than S3 charges. The circuits themselves are from 2% to 20% more expensive than S3 circuits.

- Average delay for obtaining leased line installation is 3-4 months.

EXHIBIT IV-4

VENDOR DISTRIBUTION BY SIZE, CATEGORY, AND OWNERSHIP

VENDOR SIZE BY REVENUE ($M)	NUMBER OF COMPANIES	
	PROCESSING SERVICES	OTHER
< 0.5	99	225
≥ 0.5 < 1	69	37
≥ 1.0 < 2	26	20
≥ 2.0 < 4	22	4
≥ 4.0	18	6
TOTAL	234	292

SOURCE: CSA

DISTRIBUTION BY OWNERSHIP

OWNERSHIP CATEGORY	PERCENTAGE BY NUMBER (%)
PRIVATE (LIMITED)	70%
DIVISION OF A CORPORATION	18
PARTNERSHIP/PROPRIETORSHIP	7
PUBLIC SECTOR	5%

SOURCE: CSA

EXHIBIT IV- 5

UNITED KINGDOM COMMUNICATIONS COSTS

CONNECTION CHARGES (PER CIRCUIT)			
DISTANCE (km)	COST ($)		
	PSN	S3	T
• UP TO 0.8	$ 29.25	$ 29.40	$ 39.20
• 0.8 to 8.0	29.25	49.02	78.43
• 8.1 to 16.0	48.75	49.02	78.43
• 16.1 to 80.0	68.25	68.63	117.65
• 80.1 to 160.0	107.25	107.84	176.47
• > 160 km	$146.25	$147.06	$235.29

SOURCE: UNITED KINGDOM POST OFFICE
FEBRUARY 1978

PSN LINE COSTS BY DISTANCE	$/HR. DIALED DIRECT		
	PEAK RATE	STANDARD	CHEAP
• LOCAL (VARYING RADIUS)	$ 1.76	$ 1.17	$0.29
• UP TO 56 km	7.02	4.68	1.17
• >56 km	$21.06	$14.04	$3.51

NOTE:
- PEAK RATE = MONDAY/FRIDAY, 9AM TO 1 PM
- STANDARD = MONDAY/FRIDAY, 8 TO 9AM, 1 TO 6PM
- CHEAP = ALL OTHER TIMES
- PSN = PUBLIC SWITCHED NETWORK

SOURCE: UNITED KINGDOM POST OFFICE
FEBRUARY 1978

EXHIBIT IV-6

MAIN RCS COMPETITORS IN WEST GERMANY

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	IBM	$ 10.0*	$ 2.0*	$ 12.0*	$ 38.0*
2	DATEV	9.0*	+	9.0*	39.3
3	FIDUCIA	5.3*	0.6*	5.9*	16.3*
4	MBB (1)	5.7*	0.2*	5.9*	23.7
5	HB-NIS	+	4.3*	4.3*	4.3*
6	A.C. SERVICES	3.6*	+	3.6*	9.5
7	MANNESMAN	3.0*	0.3*	3.3*	33.1
8	CDC	2.8*	0.2*	3.0*	3.4*
9	M.K.D. (2)	2.3*	0.6*	2.9*	8.1
10	TAYLORIX/ TYMSHARE	2.0*	0.5*	2.5*	50.7
11	DVO (3)	2.5*	-	2.5*	6.6
12	LKS DATEN SVC.	$ 1.8*	-	$ 1.8*	$ 4.1

($ MILLION)

* = INPUT ESTIMATE
+ = SMALL VALUE

SOURCES: INPUT CAMP/EUROPE, V.D.R.Z.

(1) - MESSERSCHMIDT-BOLKOW-BLOHM
(2) - MATHIESEN-KIENZLE-DATENSYSTEME
(3) - DATENVERARBEITUNGS-SERVICE OBERHAUSEN

- The post office has just announced a 10 year plan to increase telephone penetration from today's 45% (telephone per person) to 80%. Neither Sweden nor the U.S., who have the highest penetration rates (70-75%), attain that rate today.

- The U.K. Post Office telecommunications group has the largest budget among the Western European telecommunications authorities, spending nearly $2 billion a year (or $5.6 million a day) on improvements and network extensions. Its electronic exchange (System X) now under development will nevertheless arrive later than the Swedish, German and French equivalents.

7. CONCLUSION

- The U.K. offers strong attractions to a prospective vendor of remote computing services with a very strong market demand for such services (both timesharing and remote batch with greater demand for timesharing).

- Financial services, in the broad sense, absorb the largest proportion of the RCS market.

- Telephone communications within the U.K., while not on a par with the U.S. or Germany, are adequate; line quality is good and costs are reasonable.

- Market education as to what benefits can be achieved from RCS has been largely achieved at the large U.K. company level. Marketing argumentation needs to convince prospects of the economic value of the service, rather than explain what RCS is. At the establishment level, however, there is a penchant for the small in-house system.

- There is no language barrier, allowing U.S. staff to initially run local operations with minimum outside recruiting, if direct market intervention is preferred to acquisition.

- There are a number of suitable, privately owned RCS suppliers who could provide the entry point to the European RCS market through acquisition.

- The main disadvantages are the tax laws for individuals and the restrictions placed on movement of capital. Income tax is oppressively steep in the U.K. rising rapidly to a top rate of 83% of gross income. In addition, once money enters the U.K. it is extremely difficult to get it out.

- A minor, but by no means negligable, factor is that U.K. nationals rarely speak any foreign languages. This is a serious drawback in negotiating business on the continent.

B. WEST GERMANY

1. OVERVIEW

- In 1976, the German RCS market was worth $85 million of which only $15 million was achieved through timesharing services. By far and away the strongest market was the batch services category, which topped all other Western European country markets in that area.

- There are nearly 1000 computer services companies in West Germany. The stable nature of the German economy over the past 8-10 years has done little to force consolidation. Add to this the distributed nature of the business community served, and there emerges the picture of a market spread relatively evenly over seven major regions:

  - Stuttgart.

  - Hamburg/Bremen*.

  - Hannover/Bremen*.

- Frankfurt.

- Munich.

- Ruhr-Gebiet (Dortmund, Essen, Cologne, Düsseldorf, Duisberg).

- Berlin.

* Bremen near enough to both to be served by either.

- Each major town within these areas is served by a large variety of Batch Bureaux, each with its own specialty and near enough to the local clientele to allow fast turnaround. Germany's communications costs are the highest in Europe and do not encourage the development of RCS.

- For all of these reasons there are few very large German computer services vendors. Despite the fact that Germany is the largest market in Europe, there are a few sizeable and easily attainable market areas that are not divided between a multiplicity of small companies, all operating locally.

- The structure of the market, seen from the vendors, is thus that of a few large companies (DATEV, FIDUCIA, MANNESMAN, MBB, Taylorix, IBM) followed by several medium-sized companies (AC-Service, MKD, DVO, Honeywell, etc.) followed by innumerable very small local operations (most of which are privately held).

2. COMPETITION

- The size of the German RCS market is a reflection of its development, not its potential. This is amply demonstrated, in microcosm, by DATEV, which is owned by, and operated for, some 1,500 tax consultants. Programs, terminals, central hardware and operational procedures are all standardized and the business is thriving. Yet the vast majority of DATEV's revenue ($39.3 million in 1976) comes from batch processing on its two IBM 370/168s. DATEV has 730 employees.

- Similarly, FIDUCIA is owned by the 342 mutual loan associations (Volksbanken) who use its services, again mostly on a batch basis with less than a quarter of its $116.5 million in 1976 achieved through RB.

- Remote batch processing absorbed $70 million of the total RCS market of $85 million in 1976. Of this RB market, IBM took the lion's share ($10 million).

- IBM covers the entire German market with 13 computer centres: Essen, Cologne, Hamburg, Hannover, Berlin, Düsseldorf, Dortmund, Frankfurt, Mannheim, Nuremberg, Stuttgart, Munich and Augsburg. Interactive timesharing (APL and CALL/370) and RB (RJE and TEDIS DB/DC system) are main services.

- AC-service has also adopted the strategy of covering each local market with an independent computer centre. It has five centres in Germany (Düsseldorf, Offenbach, Hamburg, Munich, Stuttgart) and has adopted the same approach in other markets (e.g., with offices in London, Birmingham, and Manchester in the United Kingdon).

- Several large industrial companies have developed computer services groups that offer significant competition in West Germany. Foremost among these are Mathiesen-Kienzle-Datensysteme (MKD), Taylorix, Mannesman and Messerschmidt-Bolkow-Blohm (MPB).

- MKD has significant RB revenues from an on-line seat reservation and flight scheduling system and RJE-submitted billing, accounting and management information systems.

- Taylorix, a subsidiary of Stiegler Hauser, is partially owned by TYMSHARE, and offers financial applications on a batch and remote batch basis, plus professional services.

- Mannesmann is the internal EDP division of Mannesman A.G. offering technical mathematical systems processing of a T/S, RB, FM, batch and professional services basis. This group is not competition on the financial applications market.

- MBB offers mainly surveyor modeling, local land mapping, OR etc. Thus, while it is a competitor on the RB market, it is not for financial applications.

- Honeywell (or more precisely HB-NIS) easily outstrips all other competitors for the interactive timesharing and took 29% of the 1976 market.

- Honeywell has had markedly less success with its T/S services in Germany than in the U.K. and in France. The current trend of the German market toward small business systems (Kienzle, Philips, Olivetti, Nixdorf) and minicomputers (DEC, HP, DG) doesn't help the development of RCS either. The nature of the market is towards decentralized processing (in-house computers, satellite processing at the limit), not on-line, interactive services.

- For the same reasons the German CDC operation fares better in relation to Honeywell than its counterparts do in other countries.

- The positions of the leading RCS vendors are shown in Exhibit IV-7.

3. MARKET SHARES

- IBM holds the largest share of the German RCS market as it does in the batch and software products markets. Germany is IBM's strongest computer services market and computer equipment market, with a degree of synergy between the two.

- In the RB market, DATEV will shortly overtake IBM. The conversion of much of the manual delivery/over-the-counter batch business is proceeding at a strong rate, coupled with good growth of those tax consultants that are already on-line.

EXHIBIT IV-7

LEASED LINE COSTS

EQUIVALENT OF $/MONTH RENTAL

(ANNUAL CONTRACT)

LINE TYPE	RELATIVE COST
• Up to 1.2 km, cost of S3 rises in 0.2 km steps, from $5.23 to $13.92 per circuit.	S3 + 14%
• From 1.2 km to 3.2 km, S3 cost rises in 0.4 km steps, from $17.06 to $24.31.	S3 + 15%
• From 3.2 km to 6.4 km, S3 cost rises in 0.8 km steps, from $26.80 to $36.76.	S3 + 20%
• From 6.4 km to 9.6 km, S3 cost rises in 1.6 km steps, from $43.30 to $51.47.	S3 + 15%
• From 9.6 to 16 km, S3 cost rises in 3.2 km steps, from $57.19 to $66.18.	S3 + 13%
• From 16 km to 160 km, S3 cost rises in 16 km steps, from $98.04 to $296.57.	S3 + 2-13%
• Thereafter S3 cost rises in 80 km steps and cost $64.54 a step.	S3 + 9%

SOURCE: UNITED KINGDOM POST OFFICE
FEBRUARY 1978

NOTE:
- S3 and T are quality of lines provided by PTT.
- S3 is usually four-wire, T is always four-wire.
- S3 can carry up to 1200 baud, half or full duplex.
- T can carry 2400 baud in standard and 4800, 9600 baud if requested. (PSN lines are always two-wire.)

- The industrial company subsidiaries Messerschmidt-Bolkow-Blohm, Mannesman, Mathiesen-Kienzle-Datensysteme, Taylorix, and Datenverarbeitungs-Service Oberhausen (subsidiary of the German Babcock group) had a combined market share of 22% of the 1976 RB market. Much of this work is captive (40% on average) but their financial strength makes them serious competitiors.

- The interactive timesharing market is for all practical purposes divided between IBM, Honeywell, Taylorix/Tymshare and the much smaller Teledata and Timesharing Telecomputers. Market shares of leading vendors are given in Exhibit IV-8.

4. COMMUNICATIONS

- The quality of the German PTT network services is the best in Western Europe and is continually being improved. Quality is expressed as measuring the reliability of the lines provided, speed of support for installation modification, line capacity available for expansion and short delay in obtaining it.

- It is estimated that the German Public Switched Network (PSN) is, on average, never loaded beyond 80% of capacity. The result is that dialed connections always get through (unless the number dialed is busy).

- The importance, to a businessman, of this feeling of "communicability" cannot be overstressed. One only has to try to do business in Italy (where the lines between major cities are always saturated during normal working hours) to fully understand the value of good communications. The frustration caused by faulty communications is bad enough, but not being able to "get through" at all has a disastrous effect on business morale.

- Unfortunately this very high quality and availability of German communications has a stiff price. PSN line costs are up to two and one half times the cost of the peak rate for equivalent lines in the U.K.

EXHIBIT IV-8

WEST GERMAN RCS MARKET SHARES

RANK	COMPANY	RCS SERVICES PERCENTAGE SHARE (%)		
		RB	T/S	TOTAL RCS
1	IBM	14%	13%	14%
2	DATEV	13	-	11
3	FIDUCIA	8	4	7
4	MBB	8	1	7
5	HB-NIS	-	29	5
6	AC-SERVICE	5	-	4
7	MANNESMAN	4	2	4
8	CDC	4	1	4
9	MKD	3	4	3
10	TAYLORIX-TYMSHARE	3	3	3
11	DVO	4	-	3
12	LKS	3%	-	2%
		-		
		-		

- The cheaper PSN connections are those that use lines that are greater than 100 km long (the longer, the better the relative cheapness).

- Conversely, the leased lines tariff is initially reasonable but gets rapidly more expensive according to the data transmission rate and the distance used. At 2400 bps, the leased line rates in Germany are cheaper than those of the U.K. up to 100 km; at 4800 bps they are marginally cheaper up to 100 km; at 9600 bps they are more expensive. There is no comparison possible at 48,000 bps.

- Connection charges are composed of two elements: Cost of the first installation and its rental thereafter. This can be quite expensive for a multipoint connection and very expensive for complex networks. Typical charges are given in Exhibits IV-9 and IV-10.

5. CONCLUSION

- There is no question that the potential of the West German RCS market outweighs all other European markets. To date, this potential has not materialized due to:

  - The availability and variety of local batch services.

  - The successful drive of the domestic (and foreign) vendors of the small in-house business computer and office computer.

  - The high cost of communications.

- RCS competition is not formidable as yet in Germany. Vendors of broadly applicable financial applications have had some success, but not on the scale of the batch vendors. The demand for financial packages is high, however.

- Due to the distributed nature of the customer base (spread over 13 major city centres in all) local provision of services means restricted market coverage. RB services, for this reason, hold the greater promise since they can build on existing batch services while taking advantage of the concentration of workload the use of a network creates.

EXHIBIT IV-9

WEST GERMAN COMMUNICATIONS COSTS

CONNECTION CHARGES (PER CIRCUIT)	$ COST
* ONE-TIME	$ 94.73
● LOCAL CONNECT	18.96
● CENTRAL PTT CONNECT	4.74
* MONTHLY	
● BASIC CHARGE PER PTT CONNECT	15.17
● 2400 BAUD MODEM	151.66
● 1200 BAUD MODEM	101.66
● 200 BAUD MODEM	73.46
● AUTOMATIC DC SWITCHING	$100.95

PSN LINE COSTS BY DISTANCE	$/HR: DIALED DIRECT ACCORDING TO TIME OF DAY		
	06.00-18.00	18.00-22.00	22.00-06.00
● LOCAL (VARYING RADIUS)	$ 4.36	$ 4.36	$4.36
- UP TO AND INCLUDING 25 km	8.72	5.81	5.81
- > 25 km ≤ 50 km	13.08	8.72	5.81
- > 50 km ≤ 100 km	26.16	17.44	5.81
- > 100 km	$32.70	$21.80	$5.81

SOURCE: BUNDESPOST
JANUARY 1978

NOTE: PSN = PUBLIC SWITCHED NETWORK

EXHIBIT IV-10

WEST GERMAN COMMUNICATIONS COSTS

LEASED LINE TARIFF

CONNECTION CHARGES	$ COST
• ONE-TIME CHARGE FOR SPEEDS UP TO & INCLUDING 9600 bps	$ 94.79 (2 WIRE)
ONE-TIME CHARGE FOR SPEEDS UP TO & INCLUDING 9600 bps	189.57 (4 WIRE)
ONE-TIME CHARGE FOR SPEEDS UP TO INCLUDING 48,000 bps	(QUOTE)
• MONTHLY CHARGE FOR 50-9600 bps	18.96 (2 WIRE)
MONTHLY CHARGE FOR 50-9600 bps	37.91 (4 WIRE)
MONTHLY CHARGE FOR UP TO 48,000 bps	$189.57 (4 WIRE)

MONTHLY COST ($) PER 100 METRES	SPEED		
	50BPS	200BPS	1200BPS
• UP TO AND INCLUDING 10 km	$ 1.33	$ 1.33	$ 1.33
• > 10 km ≤ 50 km	0.46	0.80	1.33
• > 50 km ≤ 100 km	0.13	0.23	0.40
• > 100 km	$ 0.06	$ 0.11	$ 0.13

SOURCE: BUNDESPOST
JANUARY 1978

EXHIBIT IV-10 (CONT'D.)

WEST GERMAN COMMUNICATIONS COSTS

LEASED LINE TARIFF

MONTHLY COSTS ($) PER 100 METRES	SPEED		
	2400BPS	4800BPS	9600BPS
• UP TO AND INCLUDING 50 km	$ 1.52	$ 1.90	$ 2.37
• > 50 km ≤ 100 km	0.45	0.57	0.71
• > 100 km	$ 0.15	$ 0.19	$ 0.24

MONTHLY COSTS ($) PER 100 METRES	SPEED
	48,000 bps
• UP TO AND INCLUDING 30 km	$ 12.32
• >30 km ≤ 100 km	7.39
• >100 km	$ 2.16
MINIMUM CHARGE OF 1000 METERS	

SOURCE: BUNDESPOST
JANUARY 1978

- Prices for services of all categories in Germany are on a par with Sweden's: the highest in Europe. This situation creates opportunities for RCS where the processing centres are based in a cheaper country. (The IBM supercentre in the U.K., destined to service the whole of Europe, springs to mind.)

- If an RB marketing plan could be found that took advantage of the huge installed base of small computers (offering, say, financial consolidation services to decentralized establishments), this could provide significant potential.

C. FRANCE

I. OVERVIEW

- France is the largest European computer services market, but in contrast to the distributed nature of its competitor, Germany, 75% of all business done on the French market is done in the greater Paris area (Paris and its "banlieue"). This had led to the development of a group of very large computer services companies (in European terms).

- With nearly 700 vendors in the market, competition is very keen. But more importantly, the French market is influenced by the "old boys" network in effect, whereby who you know in business circles is almost as important as what you know about the business in question.

- Thus, the two largest computer services vendors in France, CISI/SIA, which is 100% owned by CEA (Government Atomic Energy Commission) and CAP/GEMINI/SOGETI (the largest European software company, owned 34% by CISI/SIA) swear they are competitors and operate at arm's length, while simultaneously holding regular joint planning meetings.

- This incestuous combination of government (CEA), batch, RB and T/S (CISI/SIA) and professional services and software products (CAP/GEMINI/SOGETI) has been extremely effective. They jointly captured revenues equivalent to 28% of the French market in 1976 (22% of this revenue came from foreign markets however).

- Excluding the equipment manufacturers who offer services, nearly 60% by number of the vendors in France are limited companies (Sociétés Anonymes) with a further 28% established as limited partnership Sociétés à responsabilities limitées).

- The French market is characterized by strength in two major submarkets: RCS and software products (SP). The latter has rapidly developed into the largest SP country market in Europe, with Paris headquartering many foreign (and U.S.) SP vendors. HB-NIS, the T/S marketing arm of Honeywell in Europe, also has its headquarters in Paris, of course.

2. COMPETITION

- The French RCS market was worth $154 million in 1976, of which $116 million was in RB services. IBM had an estimated 17% of this market, slightly ahead of CISI/SIA. The latter does 70% of its business with public sector clients such as the CEA, EDF (Electricity Co.) and BNP (Banque Nationale de Paris) (national bank).

- The same two companies had almost equivalent T/S revenues but were in contention for only fourth place in the interactive timesharing market. HIS-NIS has easily the largest share of T/S revenues (24%), followed by CEGOS-TYMSHARE (13%) and SLIGOS (7%).

- GSI's revenue is the consolidation of all of its holdings in DATEL (Germany), CRC (U.K.), and GSI-Europe (which includes GSI-Switzerland, mainly composed of the former SISCO operations and EAD, an Italian subsidiary). The analysis of RB revenue is therefore misleading at the holding company level, and merely serves to indicate the size of the GSI operations, not its French market share (or competitiveness in that market).

- HB-NIS, in France, has a policy of pursuing only large/very large companies, much of which is "fall-out" from their large 66 series system equipment marketing/sales activities.

- G-CAM does 75% of its business with Caisse de Dépots of which it is a subsidiary. The main operational entities are Artemis, Sinorg and IMI. Sinorg aims almost exclusively at the African and Middle East markets. In summary, G-CAM, despite its size, cannot be counted as serious competition on the open market.

- CEGOS-TYMSHARE is owned 51% by CEGOS and first became profitable in 1974. Since then its presence on the T/S market has grown considerably and it is now the undisputed second largest T/S vendor in France.

- Among the remainder, SLIGOS (already analyzed) and CDC are the most important open-market competitors. Telesystemes is for all practical purposes a PTT subsidiary, and offers T/S RB and what is almost a value added network: "Transplex." CCMC is largely batch-oriented but is growing its RB operations. It serviced over 30,000 clients in 1976 for accounting applications brought in by its CPA owners.

- Finally NATEL, a 90% owned subsidiary of BNP, is the result of adding Honeywell Bull services (20 computer centres) to a group of data entry centres (Saisinfor, Perinfor) and Natio-Services (created in September 1971). In 1973, five other groups were added (CAM,CELORAM, CERTI, SPINATIC, and STAMIC). The result was chaos. To add to the confusion the Philips data centres were added in 1974. the conglomerate thus achieved has taken three years to reorganize and is still not profitable.

- The principal vendors and their ranking by sales is given in Exhibits IV-11 and IV-12.

3. MARKET SHARES

- The RB and T/S shares are described below for those companies that have significant impact on the open market, as shown in Exhibit IV-13.

- The values listed for CISI/SIA and GSI are only an indication of activity, not true market shares, which would entail the eliminiation, by service category, of all foreign revenues.

- The values for all other companies are valid market shares based on INPUT estimates.

4. COMMUNICATIONS

- French PSN line costs are quite competitive and compare favorably with the European average, as shown in Exhibits IV-14 and IV-15. The quality of the lines does not compare well, however, nor does the average delay in obtaining lines (although this has vastly improved, halving in the last two years to today's average of 10 weeks).

- PSN connection costs are very high at the short distance end and also entail a monthly rental. As the distance grows to 150 km or more, the charge becomes more comparable to other major European countries.

- Leased lines are the most expensive in Europe and by such a margin that one wonders how they can be justified in the eyes of the PTT, let alone the users.

- When the same company uses both ends of the leased line (i.e., when the leased line is used for intercompany or intrasubsidiary communications) a 20% reduction is applied. The formulae used is directly dependent on straight line distance, such that there is a continuous variation of tariff between the tariff zones (kilometres 1, 2, 10, 20, 30, 50, 100, 150, 200, 250, 300, and 311).

EXHIBIT IV-11

MAIN RCS VENDORS IN FRANCE

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	IBM	$19.8*	$2.5*	$22.3*	$35.0*
2	CISI/SIA	18.0*	2.5*	20.5	69.2
3	GSI	15.0*	0.8*	15.8	53.8
4	HB-NIS	+	9.2*	9.2*	9.2*
5	G-CAM	5.2*	+	5.2*	30.6
6	CECOS-TYMSHARE	0.3*	4.8*	5.1	5.1
7	TÉLÉSYSTÈMES	3.5*	0.7*	4.2*	23.7
8	CCMC	4.1	-	4.1	26.2
9	NATEL	4.0*	-	4.0*	24.1
10	SLIGOS	1.7	2.7	3.4	32.9
11	CDC	3.2*	-	3.2*	3.5
12	TELSYS. INFORM.	$ 1.5*	-	$ 1.5	$12.5

($ MILLION)

SOURCE: I&G AND INPUT ESTIMATES

* = INPUT ESTIMATE

+ = SMALL VALUE

EXHIBIT IV-12

MAIN FRENCH VENDOR COMPANY STRUCTURES

VENDORS	COMPANY SHAREHOLDINGS	COMPANY SUBSIDIARIES
CAP/GEMINI/SOGETI	KAMPF (51%) CISI (34%)	CAP SOGETI LOGICIEL, SYSTÈMES, PRODUITS, FORMATION
	D'ANCIENS SOGETISTES	EURINFOR, SORINFOR, SESI, CAP EUROPE, CAP UK, GEMINI, CES CREDINTOR
CCMC	ACCOUNTANTS (58.5%) SOCIETE GENERALE (39.5%)	
CISI	CEA	INFOR SIA LTD. SOGETI (34%) EURINFOR
CERCI	EMPAIN SCHNEIDER (29%) CFUE (26%) MULLER ET CIE (23%)	
G.CAM-CAM	CAISSE DES DEPOTS (99%)	ARTEMIS (47%) SINORG IMI
GFI	BANQUE NSM	SERTI SOMAVI
GSI	COMPAGNIE GENERALE D'ELECTRICITE (52%) SOCIETE GENERALE (24%) CCF (24%)	GSI.E.CFRO, CATI, CEG, CS INFORMATIC, 31, TECSI-SOFTWARE DATEL
NATEL	BNP (90%)	STERIA, NSI, NTI, STAMIC, SPINATIC, CELORAM, CERTI
SAMM	THOMSON-BRANDT THOMSON-CSF	SAMM SA, ANSWARE, ANSWARE CONSEIL, CICERO, CIG, PERFAC, SICOS, SEFI, TD, ASAM
SEMMA	BANQUE DE PARIS ET DES PAYS-BAS	SOFRES, PAM, TRILES
SLIGOS	CREDIT LYONNAIS (92%) CEGOS (8%)	SLIGOS RHÔNE-ALPES CENTRINFORMATIQUE, SATI, CEDO SLIGOS, AXYS, IN, SLIGOS INFORMATION SYSTEMS, SLIGOS GMBH, SLIGOS BENELUX

SOURCE: I&G

EXHIBIT IV-13

MARKET SHARES OF FRENCH FIRMS

RCS RANK	COMPANY	INDICATIVE MARKET SHARES (%)		
		T/S +DC	R/B	TOTAL RCS
1	IBM	7 %	17 %	14 %
2	CISI/SIA	7	16	13
3	GSI	2	10	10
4	HB-NIS	24	-	6
5	CEGOS-TYMSHARE	13	+	3
6	CCMC	-	4	3
7	NATEL	-	3	3
8	SLIGOS	7	1	2
9	CDC	+ %	3 %	2 %

EXHIBIT IV-14

FRENCH COMMUNICATIONS COSTS

PSN CONNECTION COSTS	$ COST
• ONE-TIME	$ 147.68
• MONTHLY RENTAL	FROM $6.65 TO $8.86 ACCORDING TO CITY/TOWN CATEGORY

PSN LINE COSTS	$/HR: DIALED DIRECT	
DISTANCE	NORMAL RATE ($8.00-20.00)	CHEAP RATE ($20.00-8.00)
• LOCAL (VARYING RADIUS)	$ 0.09	$ 0.09
- UP TO 25 km	4.43	2.22
- UP TO 50 km	7.69	3.85
- UP TO 100 km	13.23	6.62
- UP TO 200 km	21.27	10.64
- GREATER THAN 200 km	$26.58	$13.29

EXHIBIT IV-15

FRENCH COMMUNICATIONS COSTS

LEASED LINE INDICATIVE TARIFF ($ MONTHLY RENTAL)			
DISTANCE (km)	2 WIRE	4 WIRE ON	4 WIRE QS
1	$ 35.86	$ 71.52	$ 78.69
2	43.25	86.50	95.15
10	102.74	205.49	226.16
20	164.77	329.54	362.66
30	226.79	453.59	498.95
50	350.84	577.64	647.89
100	572.36	799.16	913.71
150	793.88	1,020.68	1,179.54
200	1,015.40	1,242.19	1,445.36
250	1,236.92	1,463.71	1,711.18
300	1,458.44	1,685.23	1,977.00
311	$1,506.33	$1,733.12	$2,034.39
>311	SAME TARIFF AS FOR 311 km		

SOURCE: MINISTÈRE DES
P.T.T. FRANCE

- At the top end (311 km) the French tariff is approximately four times as expensive as the German tariff! Fortunately, most RCS business is done in and around Paris, and, where communications are necessary between, say, Paris and Marseilles, there are alternatives, the most important of which is TRANSPLEX.

- TRANSPLEX (from Télésystemes) is practically a value added network which offers a data highway between Paris and Marseilles with network collection points in all of the major cities in the North, West, Southwest and South. The tariff is some 25-30% cheaper for equivalent or better services than those of the PTT. Yet Télésystemes is owned by France Cables, which is owned by . . . . . the PTT!

5. CONCLUSION

- France is the prime RCS market in Europe and as such merits attention despite the difficulties facing a U.S. entrant. Establishing a Paris headquarters is no easy task. Buying into the market via the acquisition of an established French company is far more effective.

- The French like to deal at the highest levels (President, Vice President) of an organization, and with Frenchmen. Better still, if these same people are personal friends, the business opportunities are far greater. One step down from this is the "school tie" syndrome where alumni of say, l 'École Polytechnique or HEC, etc., even though perfect strangers to one another, will prefer to deal with each other rather than with someone from another school.

- In this environment, establishing a CITIBANK office staffed by Americans in Paris would be commercial suicide. An optional approach is that taken by MCAUTO, TYMSHARE, and others who jointly funded, with an established well-known French company of similar nature to themselves, the development of existing operations.

- French nationals are nearly as insular as their U.K. counterparts. (The foreign language ability of the average Frenchman usually limits him to France and Belgium.)

- RCS competition is very strong in France but the market is expanding rapidly enough to accommodate further vendors, particularly in financial applications, for which there is an increasing demand.

D. SWEDEN

1. OVERVIEW

- Just over 80 vendors supply computer services to the Swedish market, which in 1977 was worth $268 million. Of this, $58 million was produced by RCS.

- The Swedish market is characterized by high end-user prices and high staff and accommodation costs. On average, Swedish companies have a high percentage of staff dedicated to administration and low percentage of staff in sales/marketing. Turnover per employee tends to be lower in Sweden than in the other countries analyzed.

- Sweden's largest market is batch services which absorbs 52% of the total computer services market, more than the 46% average across Western Europe.

2. COMPETITION

- SPADAB, DAFA, DATEMA and BONNIERDATA provides a strong domestic challenge to the foreign suppliers (IBM, Honeywell and CDC). IBM is neither the largest overall supplier nor the prime supplier for RB, or Timesharing.

- SPADAB is owned by a consortium of Swedish savings banks and does a significant (55%) of its business "internally" for these banks. SPADAB is also very active on the open market for financial applications, however.

- DAFA is state- owned and absorbs a considerable volume of local and central government business. Nearly 60 different local government clients make use of its services. This does not stop DAFA from achieving 35% of its revenue from the open market at prices that defy competition (much to the disgust of private competitors who feel that their taxes are being used to subsidize DAFA).

- DATEMA began as the EDP department of the Axel Johnson group, and then began providing services to the open market in 1968. The RCS activities were strengthened by the acquisition of ITT Data Services. With IBM, DATEMA is the most active on the Swedish market.

3. MARKET SHARES

- The RB market is very evenly divided between the top four companies, but considering their different market emphasis, none of the four really provides competition for the others.

- This is not the case in the interactive timesharing market where Honeywell is easily ahead of all other vendors, but is in direct competition with all of them for practically the same market - interactive financial services. Market positions of the leading RCS vendors are shown in Exhibits IV-16 and IV-17.

4. COMMUNICATIONS

- Sweden's P.T.T. line costs are moderate, particularly in view of the high end-user prices and staff costs. Sweden is unique in Europe in that there is an independent supplier of communications lines and modems (Televerket) which has not only helped to keep the line costs down, but has also accelerated the speed of market penetration. As a result, the penetration rate (numbers of telephones per head of population) is comparable to that of the U.S. (70%).

EXHIBIT IV-16

MARKET SHARES OF SWEDISH FIRMS

RCS RANK	COMPANY	INDICATIVE MARKET SHARES (%)		
		T/S	RB	RCS TOTAL
1	SPADAB	- %	11 %	9 %
2	DAFA	-	10	8
3	IBM	5	9	8
4	DATEMA	4	7	6
5	HB-NIS	27	-	5
6	CDC	2	4	4
7	KOMMUN-DATA	-	5	4
8	BONNIERDATA	5%	3 %	4 %

EXHIBIT IV-17

MAIN RCS COMPETITORS IN SWEDEN

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES
		RB	T/S & DB	TOTAL	
1	SPADAB	$ 4.5*	-	$ 4.5*	$ 32.3
2	DAFA	4.3*	-	4.3*	12.9
3	IBM	3.7*	0.4*	4.1*	16.0*
4	DATEMA	2.8*	0.3*	3.1*	34.3
5	HB-NIS	-	2.3*	2.3*	2.3*
6	CDC	1.9*	0.2*	2.1*	2.4*
7	KOMMUN-DATA	2.0*	-	2.0*	11.5
8	BONNIERDATA	1.4*	0.4*	1.8*	4.1*

($ MILLION)

* = INPUT ESTIMATE

5. CONCLUSION

- The Swedish market is an attractive one, but extremely difficult to penetrate. Established vendors already provide a broad array of services and are aggressive competitors.

- The existence of heavily financed, strong RCS suppliers like SPADAB, DATEMA and DAFA in the RB market preclude the overnight creation of a foreign source of services.

- SWEDEN is a viable centre for operations aimed at the Scandinavian market (Finland, Norway, Denmark, and Sweden) being situated in the geographical centre of that market and armed with excellent quality (and reasonably priced) telecommunications.

- This approach has already been adopted by a number of computer services vendors in the Scandinavian market with good success.

- The Swedes are frequently multi-lingual, particularly with regard to the Scandinavian market, and regard the English language as a second mother tongue. (There are several Swedish newspapers that provide English language editions.)

E. BELGIUM

1. OVERVIEW

- Out of a total vendor population of 74 computer services companies in Belgium, there are 19 that supply RCS, 13 of which provide timesharing services. All are small, even CIG/GTS, which markets GE's Mark III in Belgium and which, as a result, has the largest share of the timesharing market.

- Foreign-based companies have a strong influence on the RCS market: UCC (Wyley Corp.), IBM (U.S.), CDC (U.S.), Burroughs (who operate a batch/remote batch bureau), CSC, Cyphernetics, COMSHARE (U.K./Canada) and SLIGOS (France).

- International operations, therefore, generate a high percentage of revenues, particularly since the domestic suppliers are mainly small and privately held (75%).

- International operations excepted, the domestic market is firmly entrenched in traditional, off-line data-entry/batch services (data preparation is relatively good market in Belgium).

- The total RCS market was worth a small $20 million in 1976, barely 17% of the U.K. market. As such, while personal tax laws have attracted good quality people into the Brussels area (making it an attractive location for an RCS base of operations), the domestic market is not worth competing for. There are too many suppliers competing for too few dollars.

2. COMPETITION

- All major competitiors are concentrated in Brussels where 72% (53 out of the 74 vendors) have located their main offices. This is the only local market worthy of consideration (although national suppliers do have far wider coverage, of course); ORDA-B, for example, has offices in BIERBEEK, KORTRIJK, ANTWERPEN and MAASMECHELEN in addition to its two offices in Brussels).

- The main competition for the timesharing market is largely between IBM (whose presence is strongly felt in the small Belgium market for T/S and RB services) and GE's marketing representative CIG/GTS. A challenge is slowly being mounted by COMSHARE based on highly price/competitive on-line services, but its revenues are, as yet, very small.

- In the RB market, IBM leads from ORDA-B. Along with UCC, these two absorb nearly half of the RB revenues in Belgium.

- A recent survey indicated that most of the batch and remote batch vendors were concerned at the rate of success of the in-house, minicomputer-based small business system, which has grown in popularity. Many vendors are looking to forestall the impact these systems could have on their revenues by entering into OEM agreements with manufacturers.

- The main RCS vendors in Belgium are listed in Exhibit IV-18.

3. MARKET SHARES

- Two-thirds of the Belgium RCS market is divided between six vendors, as shown in Exhibit IV-19.

- The small size of the total market makes even modest revenue appear as a significant share of the market. Nevertheless, the RB market is mostly divided between four vendors (IBM, ORDA-B, UCC, and CDC) while the interactive timesharing market is principally divided between only two, IBM and Honeywell (CIG/GTS).

4. CONCLUSION

- The Belgium market, in itself, is certainly not adequate motivation for locating offices in Brussels. The main attraction is the high number of international companies who have their headquarters in the city and who can be used as the leverage point for important international contacts.

- Brussels is also strategically placed with respect to the Netherlands, Paris (the largest slice of the French market), the Ruhr-Gebiet (the largest share of the German market), and is within striking distance of Copenhagen, London, Stockholm, and Oslo.

EXHIBIT IV-18

MAIN RCS COMPETITORS IN BELGIUM

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	IBM	$ 3.0*	$ 0.70*	$ 3.70*	$ 6.00*
2	ORDA-B	2.3	-	2.30	4.30
3	UCC	1.8*	-*	1.80*	3.50*
4	CDC	1.4*	0.20*	1.60*	1.90*
5	CIG/GTS	+	1.50*	1.50*	16.90
6	CEPOC	0.9*	0.50*	1.40*	3.70*
7	SLIGOS	0.4*	0.30*	0.70*	0.70*
8	COMSHARE	+	0.25	0.25	0.2
9	ADMINISTRA D	+	-	+	+
10	BURROUGHS	+	-	+	+
11	CSC	+	+	+	+
12	CONTINENTAL COMP.	+	+	+	+
13	CYPHERNETICS	-	+	+	+

($ MILLION)

* = INPUT ESTIMATE
+ = SMALL VALUE

SOURCE: INSEA, INPUT CAMP/EUROPE

EXHIBIT IV-19

MARKET SHARES OF BELGIAN FIRMS

RANK	COMPANY	SHARE OF RCS MARKET (%)		
		INTERACTIVE & DB TIMESHARING	REMOTE BATCH	TOTAL RCS
1	IBM	16*%	20*%	19%
2	ORDA-B	+	15*	12
3	UCC	+	12*	9
4	CDC	4*	9*	8
5	CIG/GTS	33	+	8
6	CEPOC	11 %	6 %	7%

SOURCE: INSEA AND INPUT CAMP/EUROPE

SOURCE: INSEA AND INPUT CAMP/ EUROPE

* = INPUT ESTIMATE

+ = SMALL VALUE

- Modern office accommodation and well-educated EDP staff are available in Brussels to an extent not easily duplicated elsewhere. The "basic materials" for the creation of a high quality European operation are therefore available.

- The national company tax laws are not overly restrictive on the movement of capital. This enables flexible financial transactions and profit repatriation from subsidiaries.

- Belgium nationals are frequently bi-lingual and sometimes tri-lingual. Flemish is equivalent to Dutch and is easily understood by the latter and, to some extent, by the Germans. French, the other Belgium national language, provides the link with France, of course.

F. NETHERLANDS

1. OVERVIEW

- Over 75 suppliers shared the $223 million produced by computer services in the Netherlands in 1977. Nearly 20% of these were divisions of corporations.

- Despite its relatively small size the Dutch RCS market is showing strength with significant growth in 1977 for timesharing services (29%) and in RB (12%).

- The majority of clients lie around and in the area between Amsterdam, the Hague and Rotterdam, including the cities of Utrecht and Hilversum. Companies in those cities have a catchment area of 50 km that encompasses 75% of the Dutch prospects.

2. COMPETITION

- Seven companies share 46% of the Dutch RCS market, as shown in Exhibit IV-20. The same group absorbed 40% of the RB market and 66% of the timesharing market.

EXHIBIT IV-20

MAIN RCS COMPETITORS IN THE NETHERLANDS

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	HB-NIS	$ 0.2*	$ 4.3*	$ 4.5*	$ 4.7*
2	IBM	4.3*	+	4.3*	9.0*
3	CCN (1)	3.3	0.1	3.4	12.0
4	ACD (2)	2.2	0.6	2.8	8.7
5	CDC	2.6*	+	2.6*	2.9*
6	RAET	2.0	0.5	2.5	9.9
7	ADP/ CYPHERNETICS	-	$ 2.4	$ 2.4	$ 2.4

($ MILLION)

* = INPUT ESTIMATE

+ = SMALL VALUE

(1) - COMPUTER CENTRUM NEDERLAND

(2) - ALPHA COMPUTER DIENSTEN

- IBM has a small share of the RB market (12%) closely followed by CCN (Computer Centrum Netherlands), ACD (Alpha Computer Diensten) and CDC.

- Honeywell (HB-NIS) is, as usual, the leading supplier of timesharing services but with a higher market share than usual (36%). The nearest competitior is ADP/Cyphernetics which took 20%.

3. COMMUNICATIONS

- The Netherlands offers the cheapest line costs in Europe and excellent quality. Despite this, RCS has not developed any more rapidly than the French market.

- Leased line costs are one tenth of those of France and public switched network lines are also far cheaper.

- Connection costs are equivalent to those of the U.K.

4. CONCLUSION

- For tax return reasons, for the flexibility offered by Dutch staff (who frequently speak four languages (English, French, German and Dutch - which is also understood by the Flemish) and for the lax rules applying to the movement of capital into and out of the country, the Netherlands can be a useful base of European operations, once they have grown to international proportions.

- The very low cost of telecommunications and central location of the Netherlands with respect to large regions such as the Ruhr-Gebiet (Germany) has encouraged General Electric to locate its supercentre in the Netherlands. A circe of 400 miles around Amsterdam covers all of West Germany, most of England and Scotland, Berne, Paris, Belgium and Luxembourg.

G. DENMARK

1. SUMMARY

- (This one page overview summarizes the main points of the Danish market. Detailed analysis is not provided since CITIBANK is unlikely to be accorded entry.)

- Despite the small size of its economy, Denmark has a surprisingly strong RCS market. Two state-owned vendors, Datacentralen and Kommunedata absorbed 36% of the 1976 total market, as shown in Exhibit IV-21.

- GE's timesharing representative in Denmark is ØK-Data who also provides the processing power for Kommunedata's school data processing system. Datacentralen, Kommunedata and ØK-Data jointly absorbed 60% of the timesharing market.

- IBM's participation in the Danish market is neither as competitive nor as important in terms of market share as its presence in other European markets. This has nothing to do with IBM, but is a reflection of the resilience of the national suppliers.

- ICL and Regnecentralen, two other equipment manufacturers, are also present, the former via the Danish manufacturer of minicomputers (the R XXX series).

- The Danish market is an attractive one although geographically evenly distributed (between Copenhagen, Arhus, Glostrup, Alborg and Odense). The number of suppliers (over 50) is an indication of the high competition in such a small market ($166 million in 1976 for all computer services).

EXHIBIT IV-21

MAIN RCS COMPETITORS IN DENMARK

RCS RANK	COMPANY	RCS SERVICES			ALL SERVICES TOTAL
		RB	T/S & DB	TOTAL	
1	DATACENTRALEN	$ 5.3*	$ 1.0*	$ 6.3*	$ 31.4
2	KOMMUNEDATA	3.1*	4.0*	4.0*	23.0
3	IBM	3.8*	+ *	3.8*	9.9*
4	ØK-DATA	2.5*	1.1*	3.6*	3.9
5	REGENCEN-TRALEN	1.1*	+	1.1*	11.6
6	DATAINFORM	$ 1.0*	-	$ 1.0	$ 3.2*

($ MILLION)

* = INPUT ESTIMATE

+ = SMALL VALUE

SOURCE: FDE

- After the Netherlands, the Danish telecommunications costs are the lowest in Europe (for public switched network costs). This has made on-line data capture economically viable.

- The Danish market is highly developed and computer services revenue growth is at a steady 15%, comparable to most other European markets.

V THE FINANCIAL APPLICATIONS MARKET

V THE FINANCIAL APPLICATIONS MARKET

A. OVERVIEW

- In 1977, of the total European revenue generated by financial applications packages batch services captured 80% and RCS 20%.

- While the RCS share of the total financial applications package market is relatively small, the rate of conversion of batch service-based revenues to RCS-based revenues will continue at its present fast pace such that by 1982 half of the total market will be services by RCS.

- Financial applications are the lifeblood of processing services due to their applicability across the whole spectrum of industry; particularly general accounting and payroll, budgeting/forecasting/LRP, asset accounting, costing, analysis and consolidation (of subsidiaries reporting).

- Specific industries such as financial institutions, banking and insurance have also seized on the opportunities provided by applying computing power to applications such as capital investment analysis, portfolio management and international financial dealing.

- Accounting and management consulting groups are also a strong source of processing services based revenue with taxation, auditing, receivership analysis and internal and external accounting. For these companies, RCS presents an excellent tool for organizing their consultancy/planning services due to the real time response that it provides.

B. REMOTE COMPUTING SERVICES TRENDS

- Financial institutions, banks and insurance companies all have need of large-machine capabilities (very fast turnaround, large storage capacity, data bases, high volume of input/output) but also wide ranging communication network capabilities. While most of these enterprises can afford their own large system installation, it is not economically viable (nor do they have sufficient in-house capability) for them to develop their own network.

- Competent staff in general and industry-specific staff in particular are scarce commodities in Europe. Users therefore are moving towards the centres of expertise provided by the bureaux.

- Expertise is the user's overriding consideration in evaluating competitive offers, transcending price and convenience factors (if present). Reliability, however, if inadequate or doubtful, can override all other considerations and can have disastrous effects on the company image if allowed to persist.

- RCS is becoming "fashionable" in Europe. Batch services are considered an outdated, albeit cheap source of computing power, not in keeping with an image of dynamic responsiveness. Remote batch services are, in many cases, the ideal compromise between the trend toward decentralized processing and the need for centralized reporting; RB can also expand via installed minicomputers.

- Poor quality of communications (and difficulty in obtaining them) discourages the development of RCS. The high cost of communications can be outweighed, however, by the convenience and value of the service provided. Low cost and high quality of communications (e.g., as in the Netherlands) do not actively encourage the development of RCS, but merely allow them to develop unhindered.

C. SUCCESSFUL EUROPEAN FINANCIAL PACKAGES

- There are no surprises in Exhibit V-1 which lists the major revenue-earning financial applications packages. Over 60% of them are confined to two categories:

  - Payroll

  - General Accounting

  There are, however, many variations in requirements hidden under these two titles which account for the lack of broad, pan-European success of any one package.

- It is more the rule, therefore, for really successful financial packages to be country-specific, but cross industry (e.g., a German payroll) rather than international and industry-specific.

- This does not mean that international, industry-specific packages could not find a ready market, however. For example, requirements for portfolio management and long-range planning are almost independent of country. More attention has been spent to date on the "bread and butter" applications (payroll, general accounting, sales analysis, etc.) and this is reflected in the development of the market.

- The amount of revenue generated by these packages is considerable. Note that none of the computer equipment vendors who supply services (IBM, Honeywell, CDC) have been included to avoid unfair comparisons. They also have very strong financial packages, of course, but would be very difficult to emulate by a new entrant.

EXHIBIT V-1

SUCCESSFUL FINANCIAL PACKAGES IN WESTERN EUROPE

PACKAGES GROSSING MORE THAN $ 5M PER ANNUM

NAME/FUNCTION	COMPANY	COUNTRY
● ACCOUNTING	TAYLORIX	WEST GERMANY
● PAYROLL	DATEV	WEST GERMANY
● GENERAL ACCOUNTING	DATEV	WEST GERMANY
● SAVINGS BANK DEPOSITS	SPADAB	SWEDEN
● FINANCIAL CONTROL SYSTEM	REGNECENTRALEN	DENMARK
● INTERNATIONAL PAYROLL	GSI	FRANCE

PACKAGES GROSSING $ 3M TO $ 5M PER ANNUM

● GENERAL LEDGER	DATEMA	SWEDEN
● CENTRALIZED ACCOUNTING	DAFA	SWEDEN
● PAYROLL	REGNECENTRALEN	DENMARK
● PAYROLL	MULTIDATA	DENMARK
● FINANCIAL DATABANK	BOC	UNITED KINGDOM
● GENERAL LEDGER	ALLDATA	GERMANY

PACKAGES GROSSING $ 1M TO $ 3M PER ANNUM

● PAYROLL	TAYLORIX	GERMANY
● SALES STATISTICS	TAYLORIX	GERMANY
● STATISTICAL & ECONOMICDATA	BOC	UNITED KINGDOM
● VALUATION SERVICE	CRC	UNITED KINGDOM
● CENTREPAY (PAYROLL)	CENTREFILE	UNITED KINGDOM
● BUILDING SOCIETY ACCOUNTING	GSI	FRANCE
● P1 (PAYROLL)	NATEL	FRANCE

- It should be noted that one of the companies mentioned (Natel) has been searching for someone capable of restructuring its operations. The owner, Banque Nationale de Paris (BNP), would be relieved to find an acquirer of this section of its business, which it has never understood.

D. INTERNATIONAL PACKAGES

- Financial applications packages that meet the requirements of more than one national market are few and far between, but there are several examples where good systems design has paid handsome dividends.

- GSI (Générale de Service Informatique) in France has successfully identified two truly international packages:

  - MIC, a system that was developed in the U.S., which offers a financial analysis of spare parts inventories and has customers in most of Western Europe.

  - ZADIG, a payroll system developed in Germany which is successfully used in that country, France, Italy and Switzerland.

- Regnecentralen (Denmark) has developed:

  - A financial control system (RCTT) which is sold in all of the Scandinavian countries plus the Netherlands and which could be applied in other countries. Its European impact has been limited by Regnecentralen's marketing coverage.

  - A payroll system for the same markets (RCPAY).

- DATEMA (Sweden) offers a cost accounting system (REDA) which has found clients in Sweden, Norway, Finland and Denmark.

- CMG (U.K.) has been very successful with its FACT payroll system which is sold in the Netherlands, the U.K., West Germany and Belgium.

- In addition to these packages, there are many that could be applied very broadly but which remain restricted by the limited market coverage of the company that owns them. An RCS network provides a means of achieving this broader application.

VI PROFILE OF A SUCCESSFUL NORTH AMERICAN TIMESHARING VENDOR

VI PROFILE OF A SUCCESSFUL NORTH AMERICAN TIMESHARING VENDOR

- The optimum business plan for entry into the European timesharing market is highly contingent on the "identity" of the company seeking entry (i.e., the business profile and market expertise that the company has or wishes to project). Thus, each entry plan must, of necessity, be unique. Nevertheless, it is instructive to look at the progress from inception of a business entity which has had to face similar, if not identical, problems to those facing the prospective vendor.

- COMSHARE LTD. is not a bank-owned subsidiary (Canadian Development Corp., wholly owned by Canadian Government), but INPUT has chosen this company as the prime example of a company that has "got it right." In this respect, CITIBANK can gain a useful insight in examining COMSHARE's histroy. In addition, COMSHARE's revenue is largely financial applications-based.

- COMSHARE has been the fastest growing RCS vendor since its formation in 1971. Revenue growth in 1976 was 48% (compared with the U.K. market growth of 30%), as shown in Exhibit VI-1.

- The profit before income tax (PBIT) has steadily increased since 1973; in 1976 wages were 25% of revenue, and revenue per employee was $35,000. The ratio of net cash flow to capital employed was 23.2%.

EXHIBIT VI-1

COMSHARE LTD REVENUE HISTORY

($ M)	1971	1972	1973	1974	1975	1976	1977 PLAN
● REVENUE	$ .006	$ 0.24	$ 1.00	$ 2.81	$ 4.84	$ 7.14	$ 10.00*
● % GROWTH	N/A	3000.00	317.00	181.00	72.00	48.00	40.00*
● % GROWTH LESS PRICE INCREASE (IF DIFFERENT)	N/A	N/A	N/A	N/A	N/A	38.00	27.00*
● STAFF	+	+	+	$139.00	$156.00	$170.00	$185.00*

N/A = NOT APPLICABLE
* = INPUT ESTIMATE
+ = NOT KNOWN

1. REVENUE GROWTH

- Revenue dollar volume has leaped from $6,000 in 1971, to $7.14 million just five years later with strong growth in staff, hardware assets, profit and market share.

- COMSHARE has attracted interactive problem solving business by very competitive pricing of financial planning services, storage charges and domestic link charges. However, it has sensibly placed a stiff price on international links, where costs are appreciably higher. This approach of relating prices (revenue) to ture costs has been very successful.

- Revenue has been mainly from interactive services (80% in 1976) but an attempt is being made to develop remote batch services using DATA 100 terminals.

2. GEOGRAPHIC COVERAGE/AFFILIATIONS

- COMSHARE's market expansion is far from complete, with nominal coverage of France (Paris), Belgium (Brussels), and the Netherlands (The Hague). There is no coverage at all of the other major markets (Denmark, Sweden or West Germany). European services are separate from those offered in the U.K., although London is the European HQ.

- U.K. coverage is extensive with offices in London, Aberdeen, Edinburgh, Bristol, Birmingham, Wakefield, Warrington, Washington, Winchester, and Glasgow.

- Its U.S., Canada, and Japan networks can be tied into the European network.

- COMSHARE is affiliated with COMSHARE INC. in Ann Arbor (Michigan) and with Dialog Computing International Ltd. (time brokers in London).

- COMSHARE International B.V. is the Dutch holding company and the ownership is divided:
    - Fifty-one percent Polysar (Canadian Development Corp. subsidiary).
    - Forty-six percent Comshare Inc.
    - Three percent founder members.

3. APPLICATION ORIENTATION AND STRATEGY

- COMSHARE's main strengths lie in the following applications, by decreasing order of importance to the company:
    - Financial Planning (FCS and COMPLANNER).
    - Data Base Management (COMPOSIT 77, SDRC, TARIFFICA).
    - Stock Control.
    - Foreign Exchange Systems.
    - Personnel Management System.
    - Engineering Services (IMSL).
    - Consolidation Systems (PLANMASTER).

- COMPOSIT 77 stores data in data sets of fixed length records which can interact with each other. Clause structured commands are of English language type. The data bases thus constructed can be accessed by programs written in FORTRAN or COBOL and data set. Hierarchical merging allows consolidation of several data sets.

- FCS has been in use for the last four years and was not developed by COMSHARE (bought externally). Again it is an English language report generator that produces a model which can be changed without recompilation, and again FORTRAN and COBOL programs can be run within FCS. This financial modeling system is now also used by COMSHARE INC.

- The compilers available include FORTRAN, COBOL BASIC, and D&P (Assembler).

- Marketing strategy is straightforward: leveraging product revenues on widely applicable financial and data base management by continually expanding the sales force. The following staff distribution demonstrates this:

Staff Function	at 12/31/75	Number 12/31/76	% of '76 Total
Data preparation	6	6	4
Operators	20	21	12
Programmers/Analysts	19	19	11
Sales/Marketing	91	107	63
Admin./Other	20	17	10

- Product development strategy targets other "leverage" type services such as transaction-priced packages and expanded remote batch activity based on DATA 100 terminals. The latter have an excellent reliability image in Europe and are themselves providing the sales seminars for COMSHARE.

4. HARDWARE USED

- COMSHARE has kept hardware costs low by buying second hand Xerox Sigma 9s, while keeping storage and processing capacity high. These same processors are used for an overnight batch service, exploiting available resources for revenue generation.

- Communications are based on Interdata model 50s (32-64K) of which there are 19, offering 192 access ports. Lines can be full duplex (for timesharing) at 1200 bps or 1200-4800 bps half duplex for remote batch.

- Terminals are not supplied by COMSHARE, but can be any TTY or 2780 compatible device. TTY-type devices must be ASCII 10, 30 or 50 cps and DATA 100 remote batch terminals are the recommended 2780-type device.

5. CONTRACTUAL CONDITIONS

- This aspect of a user base is of paramount importance since it determines the degree of vulnerability of the competitor, its liability, flexibility with respect to prices, rights to software which the user's system is based upon, etc.

- CITIBANK's own European contractual conditions will have to conform to the competitive environment and must therefore take existing services into account.

- The main points of COMSHARE's own agreement, pricing, payment terms, program rights and liability are as follows:

  - Agreement: Termination by either party with 30 days prior notice.

  - Prices: Can be changed with the same period of notice (30 days).

  - Payment: Net and within 14 days of invoice. (Note: This is very short. It is difficult to get anything paid in Europe in less than 30 days, and in some countries; e.g., France, 60 to 90 days is not uncommon).

  - Program Rights: All rights to work carried out by COMSHARE employees are vested in COMSHARE except when existing program are converted.

- **Liability:** COMSHARE's liability is limited to the lesser of $4,000 or one month's average billing taken over the last 12 months.

6. APPENDICES

- In order to examine more in detail the precise agreement conditions of pricing and computer services, the standard COMSHARE agreement and price schedule are included in Appendices B and C.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- COMPUTER SERVICES

These are services provided by vendors which perform data processing functions using vendor computers, or assist users to perform such functions on their own computers.

The following are definitions of the modes of service used in this report:

- REMOTE COMPUTING SERVICES (RCS)

Provision of data processing to a user by means of terminals at the user's site/s connected by a data communications network to the vendor's central computer. The three sub-modes of RCS are:

1. INTERACTIVE (timesharing) is characterized by interaction of the user with the system, primarily for problem solving timesharing, but also for data entry and transaction processing; the user is "on-line" to the program/files.

2. REMOTE BATCH is where the user hands over control of a job to the vendor's computer which schedules job execution according to priorities and resource requirements.

3. DATA BASE is characterized by the retrieval of information from a vendor-maintained data base. This may be owned by the vendor or a third party.

- BATCH SERVICES

  This includes data processing performed at vendors' sites of user programs and/or data which are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and COM processing, are also included. Batch services include those expenditures by users which take their data to a vendor site which has a terminal connected to a remote computer used for the actual processing.

- FACILITIES MANAGEMENT (FM)

  (Also referred to as "Resource Management" or "Systems Management".) The management of all or part of a user's data processing functions under a long-term contract (not less than one year). To qualify as FM, the contractor must directly plan and control as well as operate the facility provided to the user on-site, through communications lines, or in mixed mode. Simply providing resources, even though under a long-term contract and/or for all of a users' processing needs, does not necessarily qualify as FM.

- PROFESSIONAL SERVICES

  Management consulting related to EDP, systems consulting, systems design and programming, and other professional services are included in this category. Services can be provided on a basis of: "Time and Materials," whereby the user pays for the time used of an individual on a daily or other fixed rate, or "Fixed Price," where the user pays a fixed fee for a specific task or series of tasks.

- SOFTWARE PRODUCTS

  This category is for users' purchases of systems and applications packages for use on in-house computer systems. The figures quoted include lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' sites. Fees for work performed by organizations other than the package vendor are counted in professional services. The two sub-categories are:

1. SYSTEMS PACKAGES are operating systems, utilities, and language routines that enable the computer/communications system to perform basic functions. This software is provided by the mainframe manufacturers with their hardware; other vendors provide improved versions of this and special-purpose routines. This classification includes compilers, data base management software, communications packages, simulators, performance measurement software, diagnostic software, and sorts.

2. APPLICATIONS PACKAGES are software which perform processing to serve user functions. They consist of general purpose packages, such as for accounting and inventory control, and special purpose packages, such as personal trust, airline scheduling, and demand deposit accounting.

- PROCESSING SERVICES

Processing services encompass FM, RCS, and batch services: they are categorized by type of service, as distinguished from mode of service, bought by users as follows:

- GENERAL BUSINESS services are processing services for applications which are common to users across industry categories. Software is provided by the vendor; this can be a complete package, such as a payroll package, or an application "tool," such as a budgeting model, where a user provides much of the customizing of the finished product it uses. General business processing is often repetitive and transaction oriented.

- SCIENTIFIC AND ENGINEERING services are the processing of scientific and engineering problems for users across industries. The problems usually involve the solution of mathematical equations. Processing is generally problem solving and is nonrepetitive, except in the sense that the same packages or "tools" are used to address different, but similar, problems.

- INDUSTRY SPECIALTY services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an application "tool" which the user employs to produce its unique solution. Specialty applications can be either business or scientific in orientation; data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are also included under this category. Examples of industry specialty applications are: seismic data processing, numerically-controlled machine tool software development, and demand deposit accounting.

- UTILITY services are those where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

APPENDIX B: COMSHARE/COMPUTER SERVICES AGREEMENT

APPENDIX B: COMSHARE/COMPUTER SERVICES AGREEMENT

An agreement is made the day of 19 between

COMSHARE LIMITED
of 32-34 Great Peter Street, London SW1P 2DB
("COMSHARE") and
of
("the Customer")

1. COMSHARE SERVICES:

(a) Subject to the terms and conditions contained in this Agreement and/or any pricing Schedule, Amendment or Supplement (Collectively referred to hereinafter as "this Agreement"). COMSHARE will furnish computer services to the Customer and the Customer agrees to pay for said services in accordance with this Agreement and any Amendments or Attachments hereto. The services to be rendered by COMSHARE are those services for which COMSHARE has set forth a Pricing Schedule or which may be set forth from time to time in COMSHARE's published Pricing Schedules or in any written quotation made by COMSHARE to the Customer (hereinafter referred to as a "Quotation"). Copies of COMSHARE's most current Pricing Schedules and any relevant Quotation(s) are attached hereto and made a part hereof by reference.

(b) Additional services may be requested by the Customer and if available will be furnished under the general terms and conditions of this Agreement. Any request by the Customer for such additional services, or for alteration to any services proposed in a Quotation or for alteration to any associated report, or any acceptance of such request or alteration by COMSHARE shall be made in writing. Agreement must be reached concerning revised timing and charges resulting from such changes before they are implemented.

2. CHARGES: Charges for the use of any services shall be at the rate of charge set forth in COMSHARE's published Pricing Schedules as amended from time to time or in a Quotation. The amount of usage of services to be paid for by the Customer shall be that amount recorded by COMSHARE's computer systems. Charges for requested services for which there is no published rate shall be at a reasonable rate as determined by COMSHARE in the absence of prior written agreement between COMSHARE and the Customer.

3. TERM OF AGREEMENT: This Agreement shall continue from the date hereof until terminated by either party giving to the other party not less than 30 days notice in writing expiring on the last day of any calendar month.

4. REMOTE TERMINALS: All remote terminals shall be subject to the approval of COMSHARE and shall be provided by the Customer at the Customer's expense.

5. CHANGE OF RATES: All rates of charges are subject to change upon 30 days prior written notice to the Customer. Upon receipt of any notice of a rate change, the Customer may terminate this Agreement on the effective date of such change by giving COMSHARE at least 15 days prior written notice. If no notice to terminate under this provision is given to COMSHARE, the rate change will become effective at the end of the 30 day notice period.

6. TERMS OF PAYMENT: Terms are strictly net and payments are due within 14 days of the invoice. Any other terms of payment will be set forth from time to time in COMSHARE's published pricing schedules.

7. TERMINATION: Notwithstanding anything in this Agreement, COMSHARE may terminate this Agreement by notice in writing to the Customer or may withhold service in the event of the Customer being in arrears with the payment of any invoice from COMSHARE for a period of 14 days or if the Customer commits any other breach of the terms of this Agreement.

8. VALUE ADDED TAX: In this clause the Tax means the Value Added Tax. The charges specified in this Agreement do not include any allowances for the extent to which the goods and services provided by COMSHARE under this Agreement are or may be subject to the Tax and accordingly:

    (a) To the extent that the goods supplied or services rendered in the performance of this Agreement are chargeable with the Tax, the Customer shall pay to COMSHARE the amount of the Tax so chargeable in addition to the charges specified in this Agreement; and

    (b) To the extent that the supply of goods or services in the performance of this Agreement is exempt from the Tax, the Customer shall pay to COMSHARE the gross amount which COMSHARE is liable to pay in respect of the Tax chargeable on the supply to COMSHARE of articles or materials to be incorporated in the goods or on services which are required for the performance of COMSHARE's obligations under this Agreement.

9. ACTS OF THE CUSTOMER: Without prejudice to the provisions of clause 11(b) below, COMSHARE does not accept responsibility for loss or damage arising from, or the consequences of the Customer's act or default in relation to:

(a) errors in the coding of information
(b) illegible information on documents
(c) faulty, damaged or incorrectly coded computer media supplied to COMSHARE
(d) the late arrival or non-arrival of data
(e) incorrect data supplied or data out of specified sequence or in the wrong form
(f) variations in data received from those detailed in the Quotation or any associated report
(g) failure to detect error in any work carried out by COMSHARE which the Customer has undertaken to check,
(h) deficient test data which fails to show program faults.

In the event that any of the happenings to which this clause relates should necessitate additional work and/or machine time, COMSHARE reserves the right to make a fair and reasonable charge, and to revise delivery dates.

10. PROGRAM RIGHTS: Patent copyright and any other industrial property rights resulting from any programming work or the product thereof performed by a COMSHARE employee or representative with the exception of the conversion of existing Customer's programs will be vested in COMSHARE and COMSHARE reserves the right to use such product or any parts thereof for other applications.

11. GENERAL:

(a) This Agreement is not assignable or transferable by the Customer without the written consent of COMSHARE.
(b) The total of COMSHARE's liabilities under or in connection with this Agreement (arising from contract, negligence or howsoever) is limited in respect of any one event or series of connected events to the value of this Agreement or E2,000 which ever be the less. For the purposes of this sub-clause the value of this Agreement shall be deemed to be one month's average billing to the Customer taken over the 12 months preceding the month in which the damage or injury is alleged to have occurred, but if this Agreement shall not have been in effect for 12 months preceding such date then over such fewer number of preceding months that this Agreement shall have been in effect.
(c) COMSHARE shall not be responsible to the Customer if it is unable to perform or for any delay in performing its obligations hereunder for any reason beyond its control.
(d) All information or other data passed by the Customer to COMSHARE and any confidential results arising therefrom will be treated as such and will not be divulged to any third party without the Customer's consent.
(e) This Agreement supersedes all existing contracts by the parties hereto with respect to services offered herein.

12. **ARBITRATION:** If at any time any question, dispute or difference whatsoever shall arise between COMSHARE and the Customer in connection with this Agreement, either may give the other notice thereof in writing and the same shall be referred to the arbitration of a person to be mutually agreed upon or failing agreement within fourteen days of receipt of such notice of some person appointed by the Chairman for the time being of CSA. The submission shall be deemed to be a submission to arbitration within meaning of the Arbitration Act, 1950, or any statutory modification or re-enactment thereof.

13. **APPLICABLE LAW:** This agreement shall be governed by and construed in accordance with the laws of England.

AS WITNESS the hand of the parties hereto the day and year first before written.

On behalf of
The Customer
Title

On behalf of
COMSHARE
Title

APPENDIX C: COMSHARE PRICING

APPENDIX C: COMSHARE PRICING

B PRICING SCHEDULE FOR UK BASED COMMANDER II SERVICE

NOVEMBER 1976

(V.A.T. will be added to all prices)

TERMS OF PAYMENT: Terms are strictly net and payments are due within 14 days of the invoice.

a) A cash discount of 1.25% of the invoiced amount will be given for payment within 14 days of the date of the invoice.

b) COMSHARE reserves the right to add a service charge of 2% per month of the invoiced amount to all accounts outstanding for longer than 14 days.

B.1. SYSTEM USAGE CHARGES

System usage charges will be calculated on the basis of Customer usage of Productive Terminal Time, COMSHARE Computer Units, COMSHARE Storage Units, Archive Transfer Units and Remote Batch Services. Charges will be determined as follows:

B.1.1. Productive Terminal Time (PTT)

10 Characters/second	5.5p (£ 0.055) per minute of PTT
30 Characters/second	8p (£ 0.08) per minute of PTT
60/7.5 Characters/second	11p (£ 0.11) per minute of PTT
120/7.5 Characters/second	15p (£ 0.15) per minute of PTT

PTT is based on connect time, but during processing is calculated by the system as the connect time would have been used on a standard load basis.

If system load causes variations in the connect time required to complete processing, the Customer is charged only for the connect time which would have been used on the basis of the standarised system load.

B.1.2. COMSHARE Computer Units

3.6p (E0.035) per COMSHARE Computer Unit (CCU)

The number of CCUs recorded represents a load-independent measure of all significant system resources actually utilised. It can also reflect the value of proprietary software to the Customer. A discount is applied to non-interactive CCUs as detailed in B.1.6(b).

B.1.3. Mass Storage

Four levels of mass storage are available to the Customer

a) On-Line Storage - 0.55p (£0.0055) per COMSHARE Storage Unit (CSU)

On-Line Storage is measured in blocks of 2048 bytes which are assigned to the Customer upon demand. The minimum amount of storage for one file containing data is two such blocks. Two blocks are also required for each directory in use. CSUs are accumulated according to the time (to the nearest second) for which each block remains assigned to the Customer. Customer should give COMSHARE advance warning when adding more than 2000 blocks at one time.

Two types of On-Line Storage are available and CSUs are accumulated at different rates for each as follows:

i) Permanent Storage - is created by the Customer and kept available by the system until deleted by the Customer. CSUs will be accumulated at the rate of one CSU per block of Permanent Storage per 24 hours which is equivalent to a charge of 16.5p per 2048 bytes per 30 day month. In the event that the Customer reduces or deletes the amount of Permanent Storage he has been assigned, a cancellation charge of one CSU will be recorded for each block deleted.

ii) Temporary Storage - is created by the Customer and kept available by the system on Temporary Storage files which are automatically deleted when the Customer disconnects from the system (unless previously deleted by the Customer). CSUs will be accumulated at the rate of one quarter CSU per block of Temporary Storage per hour (measured to the nearest second).

b) Scheduled Storage - stored data is held at the centre on 85 million byte disc packs (subject to availability) rented or purchased by the Customer. Subsequent to reserving disc pack drive time, the disc pack is mounted and the Customer has complete unrestricted access to the drive and the mounted pack for the time desired.

Charges are 11/pack mount and drive time at 41 per hour; minimum charge 1 hour.

c) Dedicated Storage - a dedicated disc drive can be made available at a charge of £3850/month for one disc drive for one year (subject to availability) supporting up to 86 million bytes of storage on-line. At the written request of the Customer, such disc drive will be kept available for the Customer, allowing one dedicated disc pack to be on-line during all scheduled uptime hours. Use and storage of one disc pack, plus back-up packs and tapes is included in the price, together with back-up storage organisation, and normal security dumps, provided these are not required during Prime Time (0900-1800 weekdays).

Additional Customer owned or rented disc packs can be used by requesting pack changes at £11 per mount. Reasonable notice of such changes will be required and will not normally be available during Prime Time.

Each additional disc pack will require at least one back-up pack and one or more tapes. Security dumps will be taken on any day following a mount (or mounts) to safeguard up-dated information. Normal system usage charges will apply to such security dumps. Storage and rental of any additional packs and tapes will be charged extra as detailed in Schedule C.

Customer can elect to terminate Dedicated Storage upon 30 days written notice to COMSHARE and upon payment of a termination of service charge which will be determined by multiplying 40% of the monthly charge by the number of months remaining in the one-year period.

d) Archival Storage - Archival Storage provides an auxiliary storage medium for data not requiring instant access at all times. At the Customer's request from his terminal, specified files are duplicated and stored on magnetic tape. Archival stored files may be retrieved, usually upon two-hour notice. Archive transfers are charged on the basis of Archive Transfer Units (ATU). An ATU is equal to 2048 bytes of storage.

Charges:

a)	Transfer Charge	2.2p per ATU transferred to or from a Customer's Archive Storage Tape.
b)	Minimum Charge	1000 ATUs in any month when transfers are made.
c)	Tape Storage Charge	See Schedule C

B.1.4 Priority Community

The Customer's storage is kept on a disc pack (subject to availability) that is suitable for mounting on any other available COMSHARE computer, whenever the normal computer is not available. As a result it is possible to minimise the time this storage is unavailable due to nightly housekeeping, engineering maintenance and machine hardware problems.

Customers using this facility must define their requirements and be prepared to log-in to the available computer to access their storage.

For storage in the Priority Community, in addition to the normal storage charges shown in B.1.3 above, the following charges will be levied:

a) A surcharge of £110 per 30,000 CSUs per month or part thereof.

b) A minimum charge of £550 per month (not to include the surcharge) will be applied to the account containing the storage.

B.1.5. Temporary Priority Community

Customers with occasional requirement for urgent work to be completed during Non-Prime time will be able to request storage on a disc pack (subject to availability) that is suitable for mounting on any other available COMSHARE computer, when the normal computer is not available.

For storage in the Temporary Priority Community, in addition to the normal storage charges shown in B.1.3. above, the following charges will be levied:

a) If the Customer gives a minimum of 24 hours notice, excluding weekends and Statutory Public Holidays, of his requirements.

    i) A surcharge of £22 per 1000 CSUs or part thereof.

    ii) A minimum charge of £22 per day or £44 whichever is greater.

b) If the Customer gives less than 24 hours notice of his requirements.

    i) A surcharge of £44 per 1000 CSUs or part thereof.

    ii) A minimum charge of £44 per day or £110 whichever is greater.

B.1.6. Batch Services - Batch Stream

a) Remote Batch Terminal Charges - The Customer will be charged 3.85p (0.0385) per minute for the period of time during which the Customer's Remote Batch Terminal is connected to Commander II. In addition, the Customer will be charged 6.6p (0.066) per 10,000 bytes or part thereof transmitted in either direction.

b) Priority CCU Usage Discounts - CCUs are measured as in paragraph B.1.2. - the Customer chooses one of several processing priorities (subject to availability) and the following discounts are applied, whether or not the Customer submits the batch job from a Remote Batch or an Interactive Terminal:

	Priority	Discount
i)	Immediate	0%
ii)	Regular	15%
iii)	Standard	25%
iv)	Overnight or Weekend	50%

B.2 PERIPHERAL SERVICE CHARGES FOR U.K. BASED PERIPHERALS

All Peripheral Operations are subject to device availability. Devices will be scheduled by the Manager, Operations Services, who should be contacted in case of query.

Charges for peripheral services will be determined as follows:

B.2.1. Center Line Printer

Prices include postage within the U.K.

Each file copied to the printer once represents one job.

a)	User Initiated (Standard Form)	4.5p/page (including single part COMSHARE standard page)
b)	Miminum Charge for a)	72p per job
c)	User Initiated (Special Forms)	0.09p/line (plus supplies)
d)	Handling Charge for c) (Except for form 11)	E2.20 per job (including form changes)
e)	Handling Charge for c) (for form 11 only)	E1.10 per job (including form changes)

B.2.2 Card Reader

a)	Operator Initiated	£ 1.32 per 1000 cards or part thereof
b)	Minimum Charge	£ 4.40

B.2.3. Magnetic Tape

Magnetic Tape handling charge	£ 1.10/reel mount

B.2.4. Magnetic Tape Drive Time

For user-controlled use of tape drives dedicated for the duration of a job.

User initiated

a)	Prime Time (0900-1800 weekdays)	£ 16.50/drive/hour
b)	All other times	£ 5.50/drive/hour
c)	Minimum Charge	1 drive hour

B.2.5. Magnetic Tape Input (Customer's own tape)

For file transfers requested by the customer and handled by the Operator.

Operator Initiated

a)	Prime Time (0900-1800 weekdays)	2.2p per 2048 bytes or part thereof transferred
b)	All other times	1.1p per 2048 bytes or part thereof transferred

B.2.6. Magnetic Tape Output (Customer's own tape)

For file transfers requested by the Customer and handled by the Operator.

Operator Initiated

a)	Prime Time (0900-1800 weekdays)	4.4p per 2048 bytes or part thereof transferred
b)	All other times	2.2p per 2048 bytes or part thereof transferred
c)	Minimum Charge	£5.50/reel mount

B.2.7. File Transfers between Commander II Systems in the U.K.

a)	Handling Charge	£ 2.20 for each transfer
b)	Transfer charge	1.65p per block of 2048 bytes transferred

B.2.8. File Transfers between Commander II Systems (via the Ambassador Service to the US Centre)

a)	Handling Charge	£ 2.20 for each transfer
b)	Transfer Charge	55p per 10,000 bytes or part thereof transferred

B.2.9. Restoring Customer Deleted Files

Day end files may be recovered for 32 consecutive days subsequent to the last date they were held on-line overnight. Month end files no older than 13 months may be recovered at short notice. Month end files older than 13 months (if available) will be recovered at 3 days notice.

a) Recovery Charge	3.3p per 2048 bytes or part thereof recovered
b) Handling Charge (files up to 6 months	£ 5.50
c) Handling Charge (files up to 13 months old)	£ 16.50
d) Handling Charge (files more than 13 months old)	£ 44

B.2.10. Punched Paper Tape

Reading

On request, punched paper tape can be loaded to disc using a high speed paper tape reader at the following rates:

a) Handling Charge	£ 2.20 per job or 55p per tape whichever is greater
b) Transfer Charge	5.5p per 2048 bytes or part thereof transferred

B.2.11. Other Peripheral Operations

Most other peripheral operations can be handled. Quotations on request:

B.4. QUOTATIONS

All quotations for computer or peripheral facilities not listed above should be obtained from the Manager, Operations Service at the Computer Centre.

Prices for the use of the AMBASSADOR Service to the USA and Canada are available on request from your COMSHARE representative.

Normal delivery of data to customers will be by 1st class mail. Special srrangements can be made with the Manager, Operations Services to use messenger and courier services. Normal charging for such services will be at cost plus a handling charge of 25%.

EXHIBIT C-1

CONVERSION RATES USED IN THIS REPORT

ONE DOLLAR EQUALS:		
COUNTRY	RATE	UNIT
● FRANCE	$ 4.74	FRANCS
● FEDERAL REPUBLIC OF GERMANY	2.11	DEUTSCHMARKS
● UNITED KINGDOM	0.51	POUNDS STERLING
● NETHERLANDS	2.27	GUILDER
● SWEDEN	4.65	SWEDISH KRONE
● NORWAY	5.13	NORWEGIAN KRONE
● FINLAND	3.98	MARKKA
● DENMARK	5.72	KRONA
● BELGIUM	$32.70	BELGIAN FRANCS

JANUARY 31, 1978

APPENDIX D: COMPANY CONTACT LIST

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(Note: None of these companies know why an interest was shown in the restrictions or barriers affecting banks operating computer services in the various countries, nor that CITIBANK was the interested party.)

A. FRANCE

Company: NATEL
Address: 4, rue Nieuport
78140 VELIZY
Telephone: 946-96-30
Contact: Jean-Francois Dubourg
Title: President Directeur General

B. BELGIUM

Company: CIG/GTS
Address: Société Générale
rue de la Chancellerie, 13
BRUSSELS
Telephone: (02) 513-4110
Contact: Jean Solvay
Title: Director

C. DENMARK

Company: Multidata
Address: Vodroffsvej 26
COPENHAGEN V
Telephone: (01) 220111
Contact: Peder Schlegel
Title: Managing Director

D. NETHERLANDS

Company: Alpha Computer Diensten
Address: Industrieweg 130
ROTTERDAM
Telephone: (10) 151800
Contact: F. Van Iersel
Title: Managing Director

E. SWEDEN

Company: SPADAB
Address: Drottingsgatan, 29
STOCKHOLM
Telephone: (8) 14.10.20
Contact: M. Heberg
Title: Manager, EDP

F. WEST GERMANY

(i) Company: Bayerische Hypotheke Bank
Address: Theatinerstrasse, 11
8000 MUNICH 2
Telephone: (89) 23661
Contact: Herr Doktor Anton Ernstberger
Title: Vorsitzendor des Aufsichtsrates

(ii) Company: Westdeutsche Landesbank
Address: Friedrichstrasse, 56-60
4000 DÜSSELDORF
Telephone: (211) 8261
Contact: Herr Doktor Völling
Title: Vorsitzender des Vorstands

(iii) Company: Rechenzentrale Bayerische Genossenschaft
Address: Karl Hammerschmidtstrasse, 12
8000 MUNICH 81
Telephone: (89) 92371
Contact: Herr Doktor Thaler
Title: Geschäftsfuehrer

G. UNITED KINGDOM

(i) Company: Lloyds Computer Services Department
Address: 25/27, Charles II Street
LONDON SW1
Telephone: 930-95-02
Contact: L. J. Harris
Title: Manager

(ii) Company: CENTREFILE
Address: Boundary House
18/22 Furnival Street
LONDON
Telephone: 405-87-00
Contact: A. Taylor
Title: Managing Director

APPENDIX E: COMPUTER SERVICES ASSOCIATION LIST

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A. FRANCE

Company: Chambre Syndicale des Societes d'Etudes et de Conseils (SYNTEC)
Address: 3, rue Leon Bonnat
75016 PARIS
Telephone: 524-43-53
Contact: Mr. Pierre Dreyfus
Title: President

B. BELGIUM

Company: Informatic Services Association (INSEA)
Address: Avenue Victor Emmanuel III, 60
1180 BRUSSELS
Telephone: 374 20 16
Contact: Mr. J. H. Mutton
Title: Chairman

C. DENMARK

Company: Foreningen af Danske EDP Servicebureauer (FDE)
Address: Falkoner Alle 1
2000 COPENHAGEN
Telephone: 10 53 66
Contact: Mr. Knud Frederiksen
Title: Chairman

D. NETHERLANDS

Company: Computer Service-en Software Bureaus (COSSO)
Address: Van Eeeghenstraat 86
AMSTERDAM
Telephone: 020 739551
Contact: Dr. J. M. Albers
Title: President

E. SWEDEN

Company: Servicebyraernas Branschorganisation (SEBRO)
Address: Box 86
S.16212 VAELLINGBY 1
Telephone: 87 80 90
Contact: Mr. Bertil Brynander
Title: President

F. WEST GERMANY

Company: Verband Deutscher Rechenzentren E.V.
Address: Georgswall 12
3 HANNOVER
Telephone: (0511) 324926
Contact: Mr. Lange-Hellwig
Title: President

G. UNITED KINGDOM

Company:	Computer Services Association (CSA)
Address:	121 Kingsway LONDON WC2B 6PG
Telephone:	405 2171
Contact:	Mr. A. Benjamin
Title:	Director General